Mendocino County Employees' Retirement Association

Actuarial Valuation and Review as of June 30, 2019

Segal Consulting

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October 28, 2019

Board of Retirement
Mendocino County Employees' Retirement Association
625-B Kings Court
Ukiah, CA 95482-5027

Dear Board Members:

We are pleased to submit this Actuarial Valuation and Review as of June 30, 2019. It summarizes the actuarial data used in the valuation, analyzes the preceding year's experience, and establishes the funding requirements for fiscal year 2020/2021.

This report was prepared in accordance with generally accepted actuarial principles and practices at the request of the Board to assist in administering the Plan. The census information and financial information on which our calculations were based was prepared by the staff of the Association. That assistance is gratefully acknowledged.

The actuarial calculations were directed under the supervision of Andy Yeung, ASA, MAAA, FCA and Enrolled Actuary. We are members of the American Academy of Actuaries and we meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein. To the best of our knowledge, the information supplied in this actuarial valuation is complete and accurate. Further, in our opinion, the assumptions as approved by the Board are reasonably related to the experience of and the expectations for the Association.

We look forward to reviewing this report at your next meeting and to answering any questions.

Sincerely,

Segal Consulting, a Member of The Segal Group, Inc.

By:

Paul Angelo, FSA, MAAA, FCA, EA	Andy Yeung, ASA, MAAA, FCA, EA
Senior Vice President and Actuary	Vice President and Actuary

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Mendocino County Employees' Retirement Association Actuarial Valuation and Review as of June 30, 2019

Section 1: Actuarial Valuation Summary

Purpose and Basis

This report was prepared by Segal Consulting ("Segal") to present a valuation of the Mendocino County Employees' Retirement Association ("the Plan") as of June 30, 2019. The valuation was performed to determine whether the assets and contribution rates are sufficient to provide the prescribed benefits. The measurements shown in this actuarial valuation may not be applicable for other purposes. In particular, the measures herein are not necessarily appropriate for assessing the sufficiency of current Plan assets to cover the estimated cost of settling the Plan's accrued benefit obligations.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements; and changes in plan provisions or applicable law.

The contribution requirements presented in this report are based on:

- The benefit provisions of the pension plan, as administered by the Board of Retirement;
- The characteristics of covered active members, inactive vested members, and retired members and beneficiaries as of June 30, 2019, provided by the Retirement Association;
- The assets of the Plan as of June 30, 2019, provided by the Retirement Association;
- Economic assumptions regarding future salary increases and investment earnings;
- Other actuarial assumptions regarding employee terminations, retirement, death, etc. that the Board has adopted for the June 30, 2019 valuation; and
- The funding policy adopted by the Board of Retirement.

One of the general goals of an actuarial valuation is to establish contributions which fully fund the Association's liabilities, and which, as a percentage of payroll, remain as level as possible for each generation of active members. Annual actuarial valuations measure the progress toward this goal, as well as test the adequacy of the contribution rates.

In preparing this valuation, we have employed generally accepted actuarial methods and assumptions to evaluate the Association's liabilities and future contribution requirements. Our calculations are based upon member data and financial information provided to us by the Association's staff. This information has not been audited by us, but it has been reviewed and found to be consistent, both internally and with prior year's information.

The contribution requirements are determined as a percentage of payroll. The Association's employer rates provide for both Normal Cost and a contribution to amortize any unfunded or overfunded actuarial accrued liabilities. In this valuation, we have applied the funding policy adopted by the Board.[1] Details of the funding policy are provided in *Section 4, Exhibit I* on page 84.

A schedule of current amortization balances and payments may be found in *Section 3, Exhibit I on pages 70-71*. A graphical projection of the Unfunded Actuarial Accrued Liability (UAAL) amortization balances and payments has been included in *Section 3, Exhibit J* on pages 72-73.

The rates calculated in this report may be adopted by the Board for the fiscal year that extends from July 1, 2020 through June 30, 2021.

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1 A "Statement of Actuarial Funding Policy" was adopted by the Board on April 17, 2013. Subsequently, an "Actuarial Practices and Funding Policy" was adopted by the Board on April 19, 2017, which superseded the Statement of Actuarial Funding Policy. The Board amended the Actuarial Practices and Funding Policy on February 21, 2018.

Significant Issues

Ref: Pgs. 36, 37

1. In the June 30, 2018 valuation, the ratio of the valuation value of assets to actuarial accrued liabilities was 70.4%. In this June 30, 2019 valuation, this funding ratio has increased to 70.6%. On a market value basis, the funded ratio decreased from 72.5% to 71.3%.

Ref: Pgs. 29, 70-73

2. The Association's unfunded actuarial accrued liability (UAAL) as of June 30, 2018 was $212.7 million. In this year's valuation, the UAAL has increased to $219.7 million mainly due to higher than expected active salary increases and unfavorable investment experience, offset to some degree by other experience gains. A reconciliation of the Association's UAAL is provided in *Section 2, Exhibit E*. A schedule of the current UAAL amortization amounts is provided in *Section 3, Exhibit I*. Note that a graphical presentation of the UAAL amortization bases and payments has been provided as *Exhibit J* in *Section 3*.

Ref: Pg. 31

3. The aggregate employer rate calculated in this valuation has increased from 34.13% of payroll to 34.56% of payroll. The reasons for the change include losses from: (a) the anticipated one-year delay in the future from implementing contribution rates developed in the June 30, 2019 valuation, (b) the lower than expected return on investments (after smoothing), and (c) higher than expected salary increases for continuing General, Safety, and Probation active members. These losses were partially offset by gains from: (a) changes in membership demographics, (b) amortizing the prior year's UAAL over a larger than expected projected total payroll, and (c) other net gains. A reconciliation of the Association's aggregate employer rate is provided in *Section 2, Subsection F*.

Ref: Pg. 32

4. The aggregate member rate calculated in this valuation has decreased from 9.49% of payroll to 9.44% of payroll. A reconciliation of the Association's aggregate member rate is provided in *Section 2, Subsection F*.

Ref: Pgs. 94-104

The individual member rates have been updated to reflect the valuation as of June 30, 2019. These rates are provided in *Section 4, Exhibit III* of this report

Ref: Pg. 35

5. Under the Board's funding policy, in addition to the UAAL contribution rate, a dollar amortization amount equal to the UAAL contribution rate times the covered payroll (as estimated in the actuarial valuation that establishes such UAAL contribution rate) will be calculated for each employer. The final UAAL payment by each employer will be equal to the greater of the UAAL contribution rate times the actual covered payroll or the above dollar amortization amount.

   Based on information provided by MCERA, we understand that for the Mendocino County Superior Court and the Russian River Cemetery District, the UAAL contributions made during Fiscal Year (FY) 2018/2019 included an additional contribution based on the minimum dollar UAAL amortization amount for FY 2017/2018.

Ref: Pg. 20

6. As indicated in *Section 2, Subsection B*, the total unrecognized investment gain as of June 30, 2019 is $35,392 (note that in the previous valuation, this amount was a deferred gain of $10.4 million). This net investment gain will be recognized in the determination of the actuarial value of assets for funding purposes in the next few years. This implies that if the Association earns the assumed net rate of investment return of 7.00% per year on a **market value** basis, there will be investment gains on the actuarial value of assets after June 30, 2019.

   The net deferred gain of $35,392 represents less than 0.01% of the market value of assets as of June 30, 2019. Unless offset by future investment losses or other unfavorable experience, the $35,392 net deferred market gain (given the recognition pattern), is expected to have an impact on the Association's future funded percentage and contribution rate requirements. This potential impact may be illustrated as follows.

   a. If the net deferred gain was recognized immediately, and assuming further that the balance in the Contingency Reserve would be included as valuation value of assets, the funded percentage would increase from 70.6% to 71.3%.

      For comparison purposes, if the deferred gain in the June 30, 2018 valuation and the Contingency Reserve had been recognized immediately in the June 30, 2018 valuation, the funded percentage would have increased from 70.4% to 72.5%.

   b. If the net deferred gain was recognized immediately, and assuming further that the balance in the Contingency Reserve would be included as valuation value of assets, the aggregate employer rate would decrease from 34.56% to about 34.0% of payroll.

      For comparison purposes, if the net deferred gain in the June 30, 2018 valuation and the Contingency Reserve had been recognized immediately in the June 30, 2018 valuation, the aggregate employer contribution rate would have decreased from 34.27% of payroll to about 32.4% of payroll.

   Footnote (1) in the Determination of Actuarial Value of Assets on page 20 shows that under the asset smoothing method the $35,392 in the net deferred gain will be recognized in the next four years, but in a very non-level (uneven) pattern. In particular, there will be a loss of $2.1 million recognized next year, followed by a gain of $6.3 million, then a loss of $0.9 million, and then a loss of $3.2 million. This means that, absent any new gains or losses in the future, there will be some relatively large swings in the employer contribution rate that are offsetting at the end of the four years.

   In keeping with the Board's Funding Policy and consistent with similar actions taken by the Board in the past, the asset smoothing method could be modified by combining the net deferred gain of $35,392 from the current valuation into a single four-year smoothing "layer" and thereby recognizing the net deferred gain of $35,392 over the next four years in four level amounts of approximately $8,848 in each year. This would reduce the volatility associated with the current pattern of the deferred gain/loss recognition and thereby result in more stable funded ratios (on an actuarial value basis) and more level employer contribution rates.

Please note that this change would have no impact on the current June 30, 2019 valuation results as the total amount of the net unrecognized gain as of June 30, 2019 remains unchanged. Also, note that we recommend using a four-year smoothing period for the combined deferred net gain as that will complete the recognition of the net gain over the same time period as under the current separate smoothing layers. We will provide more discussion of this policy option during our presentation of the June 30, 2019 valuation.

7. The actuarial valuation report as of June 30, 2019 is based on financial information as of that date. Changes in the value of assets subsequent to that date are not reflected. Declines in asset values will increase the actuarial cost of the plan, while increases will decrease the actuarial cost of the plan.

8. We have been exploring with MCERA the feasibility of collecting historical vacation cash out data in order to determinate whether an assumption to anticipate conversion of relatively higher amounts of vacation cash outs immediately before retirement is warranted for inclusion in our future valuations. Should the requested information be available from MCERA, Segal anticipates including a detailed review of the historical vacation cash out data to develop such assumption in the next Actuarial Experience Study, scheduled for completion prior to the June 30, 2020 valuation.

Ref: Pg. 21

9. The allocation of the valuation value of assets between basic and cost-of-living (COL) as of June 30, 2019 is provided in *Section 2, Subsection B*, and is developed based on the reserves identified as either basic or COL (at book value as of June 30, 2019) as reported by MCERA. As of June 30, 2019, the proportion of the VVA by basic/COL was 54.0%/46.0%, while as of June 30, 2018, the proportion was 56.3%/43.7%, and as of June 30, 2017, was 58.6%/41.4%. The increase in the COL portion of the VVA has led to a reduction in the cost-of-living adjustment (COLA) portion of the total employer contribution rates over the last several years (as noted in footnote (3) on page 34). While this change in proportion does not impact the total basic plus COLA employer contribution rates, Segal still suggests that MCERA review the underlying reasons for the change in the proportion between basic and COL. We are available to assist MCERA in this review if requested.

Ref: Pg. 41

10. The Actuarial Standards Board approved a new Actuarial Standard of Practice No. 51 (ASOP 51) regarding risk assessment. ASOP 51 is effective with MCERA's June 30, 2019 actuarial valuation. ASOP 51 requires actuaries to identify and assess risks that "may reasonably be anticipated to significantly affect the plan's future financial condition." Examples of key risks listed that are particularly relevant to MCERA are asset/liability mismatch risk, investment risk, and longevity risk. The standard also requires an actuary to consider if there is any ongoing contribution risk to the plan, however it does not require the actuary to evaluate the particular ability or willingness of contributing entities to make contributions when due, nor does it require the actuary to assess the likelihood or consequences of future changes in applicable law.

    The actuary's initial assessment can be strictly a qualitative discussion about potential adverse experience and the possible effect on future results, but it may also include quantitative numerical demonstrations where informative. The actuary is also encouraged to consider a recommendation as to whether a more detailed assessment or risk report would be significantly beneficial for the intended user in order to examine particular financial risks. When making that recommendation, the actuary will take into account such factors as the plan's design, risk profile, maturity, size, funded status, asset allocation, cash flow, possible insolvency and current market conditions.

Since the actuarial valuation results are dependent on a fixed set of assumptions and data as of a specific date, there is risk that emerging results may differ, perhaps significantly, as actual experience is fluid and will not exactly track current assumptions. This potential divergence may have a significant impact on the future financial condition of the plan. We have not been engaged to perform a detailed analysis of the potential range of the impact of risk relative to the Association's future financial condition, but have included a brief discussion of key risks that may affect the Association in *Section 2, Subsection J*. A more detailed assessment of the risks tailored to specific interests or concerns of the Board would provide the Board with a better understanding of the inherent risks and is recommended. This assessment would further discuss and highlight information and risks particular to MCERA such as detailed historical experience and key events, growing plan maturity, heightened contribution sensitivity to asset and liability changes, and projected sensitivity to potential future investment returns through selected scenario or stress test projections. We will provide more discussion during our presentation of the June 30, 2019 valuation.

Summary of Key Valuation Results

		June 30, 2019		June 30, 2018	
		Total Rate	Estimated Annual Dollar Amount[1]	Total Rate	Estimated Annual Dollar Amount[1]
Employer Contribution Rates: (payable at the end of each pay period)	• General Tier 1	35.28%	$151,000	34.41%	$147,000
	• General Tier 2/Tier 3	31.76%	8,999,000	30.92%	8,761,000
	• General Tier 4	28.63%	8,216,000	27.74%	7,961,000
	• Safety Tier 1		Not Calculated[2]		
	• Safety Tier 2	60.51%	4,254,000	62.95%	4,425,000
	• Safety Tier 3	50.06%	1,994,000	52.43%	2,089,000
	• Probation Tier 1		Not Calculated[2]		
	• Probation Tier 2	38.92%	628,000	36.42%	588,000
	• Probation Tier 3	32.56%	337,000	29.50%	305,000
	All Categories Combined	34.56%	$24,579,000	34.13%	$24,276,000
		Total Rate	Estimated Annual Dollar Amount[1]	Total Rate	Estimated Annual Dollar Amount[1]
Average Member Contribution Rates:	• General Tier 1[3]	1.64%	$7,000	1.64%	$7,000
	• General Tier 2/Tier 3	10.64%	3,015,000	10.63%	3,012,000
	• General Tier 4	7.46%	2,141,000	7.58%	2,175,000
	• Safety Tier 1		Not Calculated[2]		
	• Safety Tier 2	11.08%	779,000	11.03%	775,000
	• Safety Tier 3	10.98%	437,000	11.08%	441,000
	• Probation Tier 1		Not Calculated[2]		
	• Probation Tier 2	13.59%	219,000	13.60%	220,000
	• Probation Tier 3	11.30%	117,000	11.74%	121,000
	All Categories Combined	9.44%	$6,715,000	9.49%	$6,751,000

(1) Based on June 30, 2019 projected annual compensation.

(2) There were no Safety Tier 1 or Probation Tier 1 active members reported for the June 30, 2019 and June 30, 2018 valuations.

(3) The majority of General Tier 1 members are exempt from employee contributions (i.e., they have a 0.00% member contribution rate because they have 30 or more years of service). These exempt members have the effect of generating a low average member contribution rate for the entire group.

Summary of Key Valuation Results (continued)

		June 30, 2019	June 30, 2018
Actuarial Accrued Liability as of June 30:	• Retired members and beneficiaries	$496,602,273	$470,678,231
	• Inactive vested members	34,999,464	33,824,166
	• Active members	215,463,637	212,959,596
	• Total Actuarial Accrued Liability[1]	747,065,374	717,461,993
	• Normal Cost for plan year beginning June 30	14,263,000	14,055,000
Assets as of June 30:	• Market Value of Assets (MVA)	$532,727,019	$520,429,961
	• Actuarial Value of Assets (AVA)	532,691,627	510,023,422
	• AVA as a percentage of MVA	100.0%	98.0%
	• Valuation Value of Assets (VVA)[2]	$527,367,477	$504,803,711
Funded status as of June 30:	• Unfunded Actuarial Accrued Liability on MVA basis	$214,338,355	$197,032,032
	• Funded percentage on MVA basis	71.3%	72.5%
	• Unfunded Actuarial Accrued Liability on VVA basis	$219,697,897	$212,658,282
	• Funded percentage on VVA basis	70.6%	70.4%
Key assumptions:	• Net investment return	7.00%	7.00%
	• Price inflation	3.00%	3.00%
	• Payroll growth	3.50%	3.50%

(1) Does not include an additional liability held for the Contingency Reserve.

(2) Excludes Contingency Reserve.

Summary of Key Valuation Results (continued)

		June 30, 2019	June 30, 2018	Change From Prior Year
Demographic data as of June 30:	**Active Members:**			
	• Number of members	1,151	1,162	-0.9%
	• Average age	45.9	46.5	-0.6
	• Average service	8.6	8.8	-0.2
	• Total projected compensation[1]	$71,124,175	$67,955,820	4.7%
	• Average projected compensation	$61,793	$58,482	5.7%
	Retired Members and Beneficiaries:			
	• Number of members:			
	– Service retired	1,218	1,161	4.9%
	– Disability retired	178	176	1.1%
	– Beneficiaries	156	153	2.0%
	– Total	1,552	1,490	4.2%
	• Average age	69.5	69.3	0.2
	• Average monthly benefit	$1,979	$1,919	3.1%
	Inactive Vested Members:			
	• Number of members[2]	515	497	3.6%
	• Average Age	46.5	46.4	0.1
	Total Members:	3,218	3,149	2.2%

[1] For June 30, 2019 (June 30, 2018), total projected compensation represents the annualized actual pensionable compensation earned during the 2018/2019 (2017/2018) fiscal year, but limited to the annualized biweekly pay rate plus other annual pensionable pay as of the measurement date, and projected to account for expected salary increases for the following fiscal year based on the actuarial assumptions.

[2] Includes inactive members due a refund of member contributions.

Important Information About Actuarial Valuations

An actuarial valuation is a budgeting tool with respect to the financing of future projected obligations of a pension plan. It is an estimated forecast – the actual long-term cost of the plan will be determined by the actual benefits and expenses paid and the actual investment experience of the plan.

In order to prepare a valuation, Segal relies on a number of input items. These include:

Plan of benefits	Plan provisions define the rules that will be used to determine benefit payments, and those rules, or the interpretation of them, may change over time. Even where they appear precise, outside factors may change how they operate. It is important to keep Segal informed with respect to plan provisions and administrative procedures, and to review the plan summary included in our report to confirm that Segal has correctly interpreted the plan of benefits.
Participant data	An actuarial valuation for a plan is based on data provided to the actuary by the Association. Segal does not audit such data for completeness or accuracy, other than reviewing it for obvious inconsistencies compared to prior data and other information that appears unreasonable. It is important for Segal to receive the best possible data and to be informed about any known incomplete or inaccurate data.
Assets	The valuation is based on the Market Value of Assets as of the valuation date, as provided by the Association. The Association uses an "Actuarial Value of Assets" that differs from market value to gradually reflect year-to-year changes in the Market Value of Assets in determining the contribution requirements.
Actuarial assumptions	In preparing an actuarial valuation, Segal projects the benefits to be paid to existing plan participants for the rest of their lives and the lives of their beneficiaries. This projection requires actuarial assumptions as to the probability of death, disability, withdrawal, and retirement of each participant for each year. In addition, the benefits projected to be paid for each of those events in each future year reflect actuarial assumptions as to salary increases and cost-of-living adjustments. The projected benefits are then discounted to a present value, based on the assumed rate of return that is expected to be achieved on the plan's assets. There is a reasonable range for each assumption used in the projection and the results may vary materially based on which assumptions are selected. It is important for any user of an actuarial valuation to understand this concept. Actuarial assumptions are periodically reviewed to ensure that future valuations reflect emerging plan experience. While future changes in actuarial assumptions may have a significant impact on the reported results, that does not mean that the previous assumptions were unreasonable.

The user of Segal's actuarial valuation (or other actuarial calculations) should keep the following in mind:

- The actuarial valuation is prepared at the request of the Board. Segal is not responsible for the use or misuse of its report, particularly by any other party.
- An actuarial valuation is a measurement of the plan's assets and liabilities at a specific date. Accordingly, except where otherwise noted, Segal did not perform an analysis of the potential range of future financial measures. The actual long-term cost of the plan will be determined by the actual benefits and expenses paid and the actual investment experience of the plan. Future contribution requirements may differ from those determined in the valuation because of:
  - Differences between actual experience and anticipated experience;
  - Changes in actuarial assumptions or methods;
  - Changes in statutory provisions; and
  - Differences between the contribution rates determined by the valuation and those adopted by the Board.
- If the Association is aware of any event or trend that was not considered in this valuation that may materially change the results of the valuation, Segal should be advised, so that we can evaluate it.
- Segal does not provide investment, legal, accounting, or tax advice. Segal's valuation is based on our understanding of applicable guidance in these areas and of the plan's provisions, but they may be subject to alternative interpretations. The Board should look to their other advisors for expertise in these areas.

As Segal has no discretionary authority with respect to the management or assets of the Retirement Association, it is not a fiduciary in its capacity as actuaries and consultants with respect to the Retirement Association.

Section 2: Actuarial Valuation Results

A. Member Data

The Actuarial Valuation and Review considers the number and demographic characteristics of covered members, including active members, inactive vested members, retired members and beneficiaries.

This section presents a summary of significant statistical data on these member groups.

More detailed information for this valuation year and the preceding valuation can be found in *Section 3, Exhibits A, B, and D.*

MEMBER POPULATION: 2010 – 2019[1]

Year Ended June 30	Active Members	Inactive Vested Members[2]	Retired Members and Beneficiaries	Total Non-Actives	Ratio of Non-Actives to Actives	Ratio of Retired Members and Beneficiaries to Actives
2010	1,254	395	1,083	1,478	1.18	0.86
2011	1,129	389	1,129	1,518	1.34	1.00
2012	1,069	356	1,217	1,573	1.47	1.14
2013	1,072	345	1,287	1,632	1.52	1.20
2014	1,081	394	1,328	1,722	1.59	1.23
2015	1,107	414	1,379	1,793	1.62	1.25
2016	1,123	428	1,416	1,844	1.64	1.26
2017	1,123	479	1,462	1,941	1.73	1.30
2018	1,162	497	1,490	1,987	1.71	1.28
2019	1,151	515	1,552	2,067	1.80	1.35

(1) Information prior to 2011 has been extracted from the previous actuary's past valuation reports.

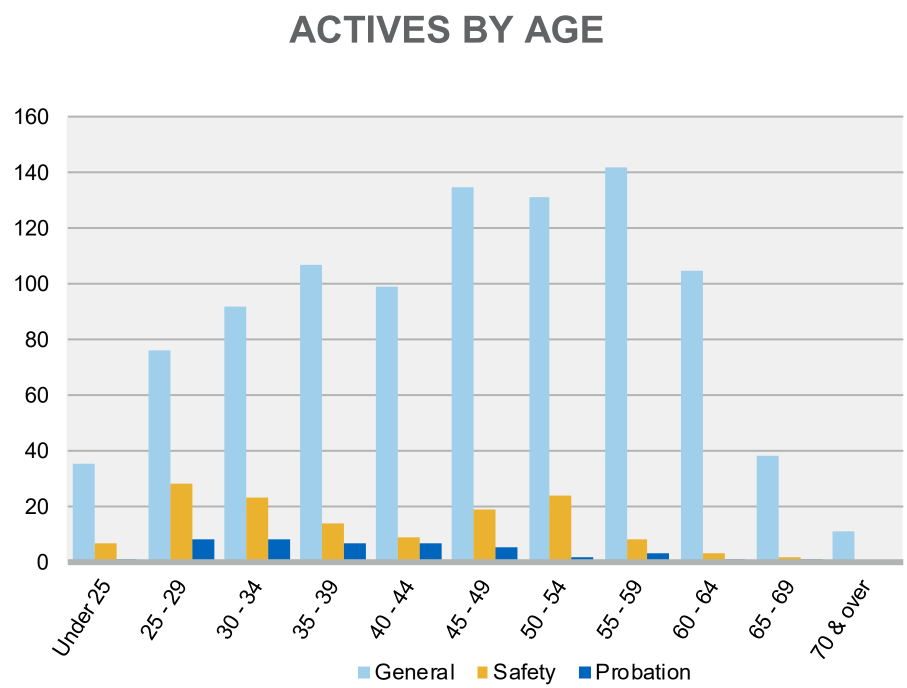
(2) Includes pending withdrawals and pending disabilities prior to 2011. For years ended June 30, 2011 and later, inactive vested members include terminated members due a refund of member contributions.

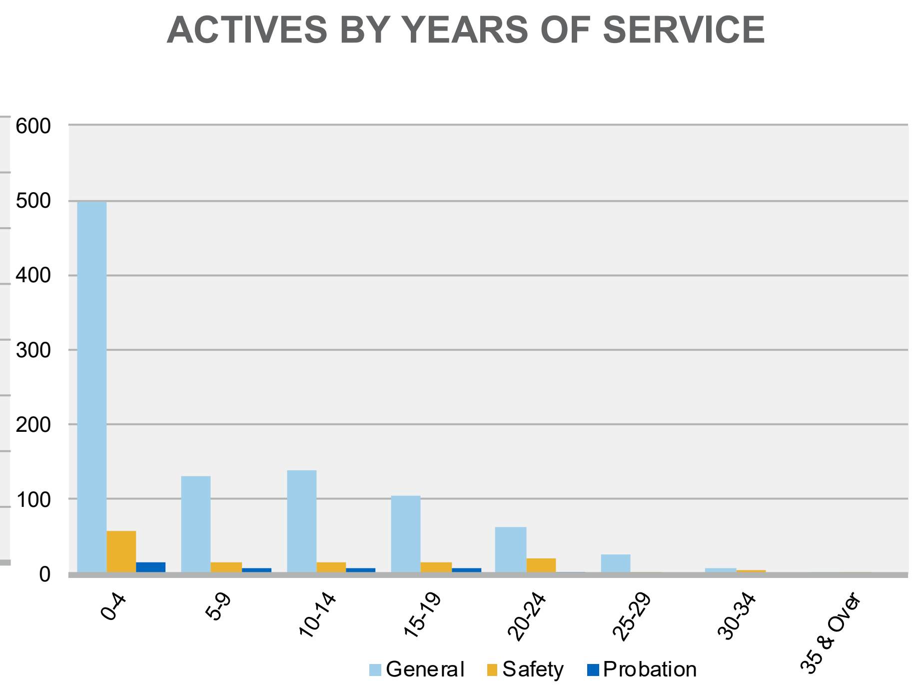
Active Members

Plan costs are affected by the age, years of service and compensation of active members. In this year's valuation, there were 1,151 active members with an average age of 45.9, average years of service of 8.6 years and average compensation of $61,793. The 1,162 active members in the prior valuation had an average age of 46.5, average service of 8.8 years and average compensation of $58,482.

Among the active members, there were none with unknown age information.

Distribution of Active Participants as of June 30, 2019





Inactive Members

In this year's valuation, there were 515 members with a vested right to a deferred or immediate vested benefit or entitled to a return of their member contributions versus 497 in the prior valuation.

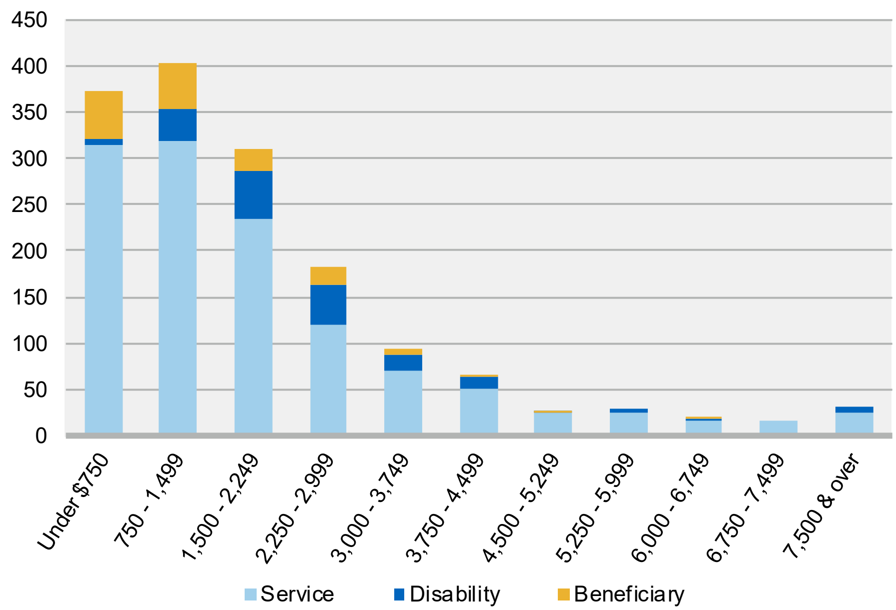
Retired Members and Beneficiaries

As of June 30, 2019, 1,396 retired members and 156 beneficiaries were receiving total monthly benefits of $3,071,976. For comparison, in the previous valuation, there were 1,337 retired members and 153 beneficiaries receiving monthly benefits of $2,859,061.

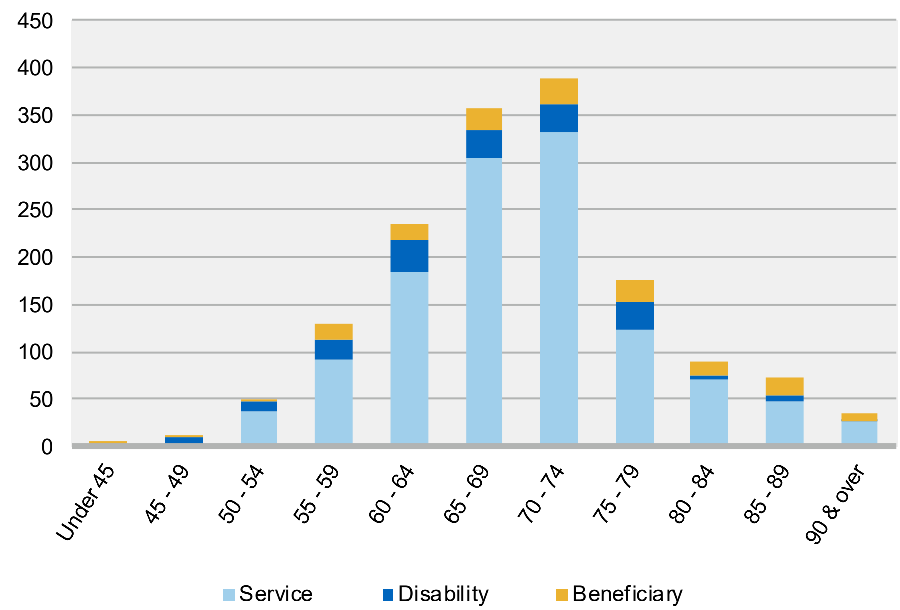
As of June 30, 2019, the average monthly benefit for retired members and beneficiaries is $1,979, compared to $1,919 in the previous valuation. The average age for retired members and beneficiaries is 69.5 in the current valuation, compared with 69.3 in the prior valuation.

Distribution of Retired Members and Beneficiaries as of June 30, 2019

RETIRED MEMBERS AND BENEFICIARIES BY TYPE AND MONTHLY AMOUNT



RETIRED MEMBERS AND BENEFICIARIES BY TYPE AND AGE



Historical Plan Population

The chart below demonstrates the progression of the active population over the last ten years. The chart also shows the growth among the retired population over the same time period.

MEMBER STATISTICS: 2010 – 2019[1]

	Active Participants			Retired Members and Beneficiaries		
Year Ended June 30	Count	Average Age	Average Service	Count	Average Age	Average Monthly Amount
2010	1,254	48.2	9.4	1,083	67.7	$1,531
2011	1,129	49.0	10.3	1,129	67.9	1,572
2012	1,069	48.7	10.6	1,217	68.1	1,610
2013	1,072	48.2	10.2	1,287	68.1	1,661
2014	1,081	47.3	9.8	1,328	68.3	1,708
2015	1,107	47.2	9.4	1,379	68.6	1,768
2016	1,123	47.0	9.1	1,416	68.8	1,822
2017	1,123	46.7	9.1	1,462	69.1	1,846
2018	1,162	46.5	8.8	1,490	69.3	1,919
2019	1,151	45.9	8.6	1,552	69.5	1,979

(1) Information prior to 2011 has been extracted from the previous actuary's past valuation reports.

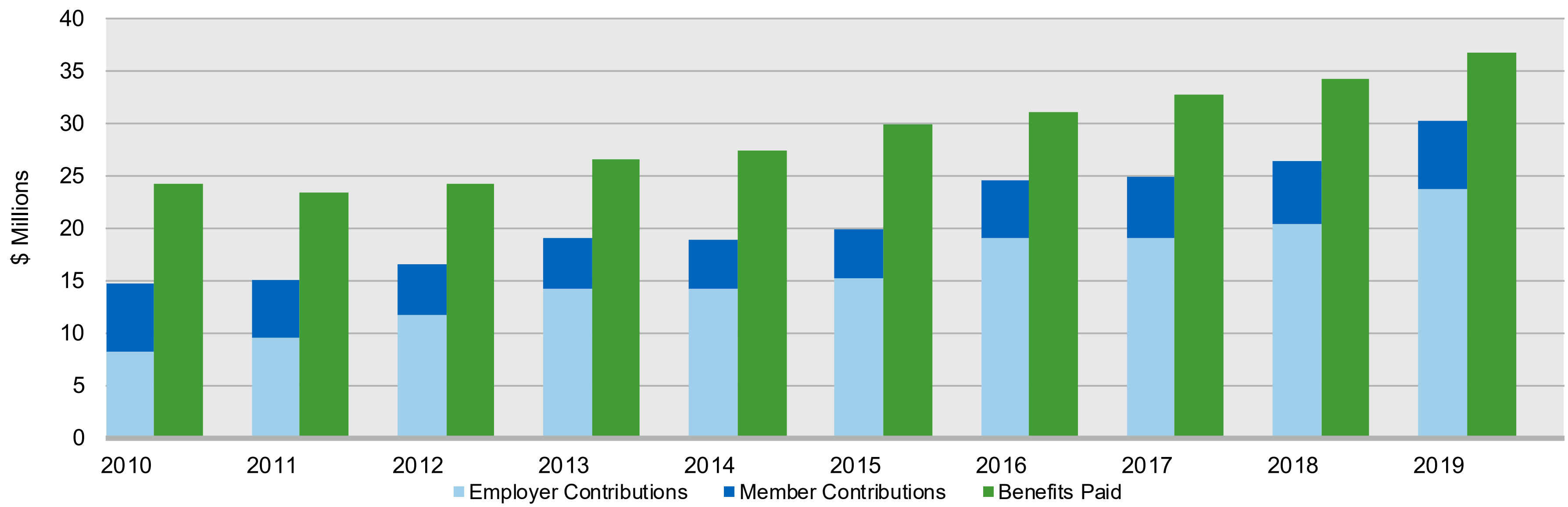
B. Financial Information

Retirement plan funding anticipates that, over the long term, both contributions and investment earnings (less investment fees and administrative expenses) will be needed to cover benefit payments. Retirement plan assets change as a result of the net impact of these income and expense components.

Additional financial information, including a summary of transactions for the valuation year, is presented in *Section 3, Exhibits F, G, and H.*

It is desirable to have level and predictable plan costs from one year to the next. For this reason, the Board has approved an asset valuation method that gradually adjusts to market value. Under this valuation method, the full value of market fluctuations is not recognized in a single year and, as a result, the valuation asset value and the plan costs are more stable. The amount of the adjustment to recognize market value is treated as income, which may be positive or negative. Realized and unrealized gains and losses are treated equally and, therefore, the sale of assets has no immediate effect on the actuarial value.

COMPARISON OF CONTRIBUTIONS WITH BENEFITS FOR YEARS ENDED JUNE 30, 2010 – 2019



DETERMINATION OF ACTUARIAL VALUE OF ASSETS

		Actual Return	Expected Return	Investment Gain (Loss)	Percent Deferred	Deferred Return
1	**Market Value of Assets**					**$532,727,019**
2	Calculation of deferred return					
a)	Year ended June 30, 2015	$13,201,309	$31,658,013	$(18,456,704)	0%	$0
b)	Year ended June 30, 2016	(10,352,325)	31,932,904	(42,285,229)	20	(8,457,046)
c)	Year ended June 30, 2017	66,669,864	30,583,939	36,085,925	40	14,434,370
d)	Year ended June 30, 2018	45,271,985	33,571,464	11,700,521	60	7,020,313
e)	Year ended June 30, 2019	19,959,119	36,161,925	(16,202,806)	80	(12,962,245)
f)	Total deferred return[1]					$35,392
3	Preliminary Actuarial Value of Assets **1 – 2f**					532,691,627
4	Adjustment to be within 25% corridor					0
5	**Final Actuarial Value of Assets 3 + 4**					**$532,691,627**
6	Actuarial Value of Assets as a percentage of Market Value of Assets **5 ÷ 1**					100.0%
7	Non-valuation reserves and designations:					
	Contingency Reserve					$5,324,150
8	**Final Valuation Value of Assets[2] 5 – 7**					**$527,367,477**

[1] Deferred return as of June 30, 2019 to be recognized in each of the next four years:

(a) Amount recognized on June 30, 2020	$(2,140,318)
(b) Amount recognized on June 30, 2021	6,316,728
(c) Amount recognized on June 30, 2022	(900,457)
(d) Amount recognized on June 30, 2023	(3,240,561)
(e) Total unrecognized return as of June 30, 2019	$35,392

[2] Note that the valuation value of assets for each of the General, Safety, and Probation membership groups has generally been calculated in proportion to the book value reserves maintained by MCERA for those three membership groups. The allocation of the valuation value of assets between the three membership groups is provided in the chart on the next page.

Note: Amounts may not total exactly due to rounding.

The allocation of the valuation value of assets as of June 30, 2019 by membership group was determined as follows:

ALLOCATION OF THE VALUATION VALUE OF ASSETS AS JUNE 30, 2019

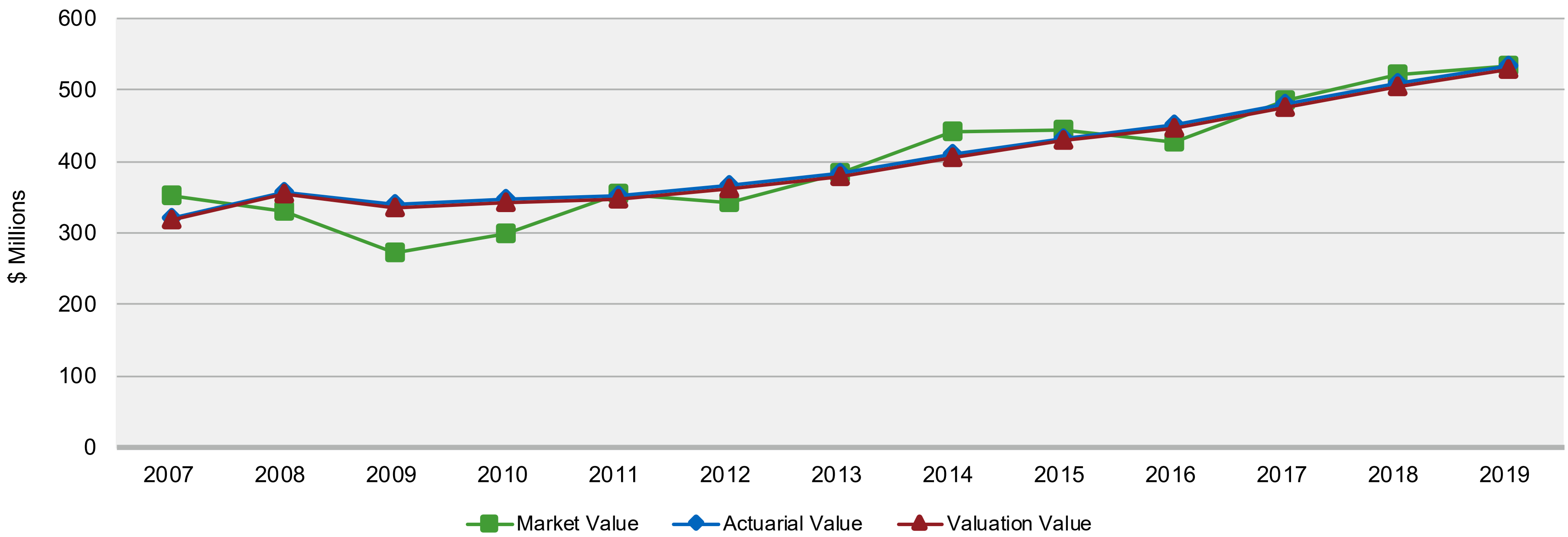
	Account ID	General	Safety	Probation	Total
BASIC					
Reserves at Book Value (Provided by MCERA)					
Employee Contributions with Interest[1]	4000, 4001 & 4002	$42,723,905	$5,970,619	$2,467,314	$51,161,838
County Advance Reserve (Basic)	4501, 4502, 4503, 4510, 4511, 4512, 4513, 4520, 4521, & 4522	-130,695,840	-32,153,715	-4,821,353	-167,670,908
Retirees Annuity Reserve	4110, 4111, 4120, 4121, 4122, 4123, 4130, 4131, & 4132	99,381,356	25,812,596	1,351,122	126,545,074
Retirees Current Service Reserve	4210, 4211, 4220, 4221, 4222, 4223, 4230, 4231, & 4232	174,597,889	57,842,220	12,454,425	244,894,534
Survivors Death Benefit Reserve	4311, 4320, 4322, 4330, & 4331	-15,621,816	-4,140,158	-162,840	-19,924,815
Subtotal		$170,385,494	$53,331,562	$11,288,668	$235,005,724
Actuarial Value of Assets (AVA; Calculated by Segal) [2]		$206,285,639	$64,568,498	$13,667,186	$284,521,323
COL					
Reserves at Book Value (Provided by MCERA)					
Employee Contributions with Interest[1]	4003 & 4004	$12,421,495	$3,821,523	$1,098,932	$17,341,950
County Advance Reserve (COLA)	4514, 4515, & 4523	4,769,014	1,746,206	438,291	6,953,511
Retirees COLA Reserve	4410, 4411, 4420, 4421, 4422, 4423, 4430, 4431, & 4432	127,885,273	38,958,303	9,444,300	176,287,876
Subtotal		$145,075,782	$44,526,032	$10,981,523	$200,583,337
Actuarial Value of Assets (Calculated by Segal) [3]		$175,643,183	$53,907,647	$13,295,324	$242,846,154
TOTAL					
Reserves at Book Value (Provided by MCERA)		$315,461,275	$97,857,594	$22,270,191	$435,589,061
Actuarial Value of Assets (Calculated by Segal)		381,928,822	118,476,145	26,962,510	527,367,477

(1) Breakdown of total amount is allocated by Segal based on proportion of member contribution account balances of active and inactive vested members included in the valuation.
(2) The total basic AVA is allocated by Segal based on the proportion of total basic reserves to total basic and COL reserves provided by MCERA. The breakdown of the basic AVA between groups is allocated based on the subtotal basic reserves.
(3) The total COL AVA is allocated by Segal based on the proportion of total COL reserves to total basic and COL reserves provided by MCERA. The breakdown of the COL AVA between groups is allocated based on the subtotal COL reserves.

Note: Results may be slightly off due to rounding.

The Market Value, Actuarial Value, and Valuation Value of Assets are representations of the Plan's financial status. As investment gains and losses are gradually taken into account, the Actuarial Value of Assets tracks the Market Value of Assets. The Valuation Value of Assets is the actuarial value, excluding any non-valuation reserves. The Valuation Value of Assets is significant because the Plan's liabilities are compared to these assets to determine what portion, if any, remains unfunded. Amortization of the Unfunded Actuarial Accrued Liability is an important element in determining the contribution requirement.

MARKET VALUE, ACTUARIAL VALUE, AND VALUATION VALUE OF ASSETS AS OF JUNE 30, 2007 – 2019



C. Actuarial Experience

To calculate any actuarially determined contribution, assumptions are made about future events that affect the amount and timing of benefits to be paid and assets to be accumulated. Each year actual experience is measured against the assumptions. If overall experience is more favorable than anticipated (an actuarial gain), the actuarially determined contribution will decrease from the previous year. On the other hand, the actuarially determined contribution will increase if overall actuarial experience is less favorable than expected (an actuarial loss).

Taking account of experience gains or losses in one year without making a change in assumptions reflects the belief that the single year's experience was a short-term development and that, over the long term, experience will return to the original assumptions. For contribution requirements to remain stable, assumptions should approximate experience.

If assumptions are changed, the contribution requirement is adjusted to take into account a change in experience anticipated for all future years. There are no assumption changes reflected in this report.

The total loss is $8.4 million, which includes $4.8 million from investment losses and $3.6 million in losses from all other sources. The net experience variation from individual sources other than investments and contributions was 0.49% of the Actuarial Accrued Liability. A discussion of the major components of the actuarial experience is on the following pages.

ACTUARIAL EXPERIENCE FOR YEAR ENDED JUNE 30, 2019

1	Net loss from investments[1]	$(4,842,261)
2	Net loss from other experience[2]	(3,626,469)
3	Net experience loss: 1 + 2	$(8,468,730)

[1] Details on next page.

[2] See *Subsection E* for further details. Does not include the effect of plan or assumption changes, if any.

Investment Experience

A major component of projected asset growth is the assumed rate of return. The assumed return should represent the expected long-term rate of return, based on the Plan's investment policy. The rate of return on the Market Value of Assets was 3.86% for the year ended June 30, 2019.

For valuation purposes, the assumed rate of return on the Valuation Value of Assets was 7.00% for the June 30, 2018 valuation. The actual rate of return on a valuation basis for the 2018/2019 plan year was 6.03%. Since the actual return for the year was less than the assumed return, the Plan experienced an actuarial loss during the year ended June 30, 2019 with regard to its investments.

INVESTMENT EXPERIENCE FOR YEAR ENDED JUNE 30, 2019

		Market Value	Actuarial Value	Valuation Value
1	Net investment income	$19,959,119	$30,330,266	$30,225,827
2	Average value of assets	516,598,931	506,192,392	500,972,681
3	Rate of return: 1 ÷ 2	3.86%	5.99%	6.03%
4	Assumed rate of return	7.00%	7.00%	7.00%
5	Expected investment income: 2 x 4	$36,161,925	$35,433,467	$35,068,088
6	Actuarial gain/(loss): 1 – 5	$(16,202,806)	$(5,103,201)	$(4,842,261)

Because actuarial planning is long term, it is useful to see how the assumed investment rate of return has followed actual experience over time. The chart below shows the rate of return on an actuarial and valuation basis compared to the actual market value investment return for the last ten years, including averages over select time periods.

INVESTMENT RETURN – MARKET VALUE, ACTUARIAL VALUE AND VALUATION VALUE: 2010 – 2019[1]

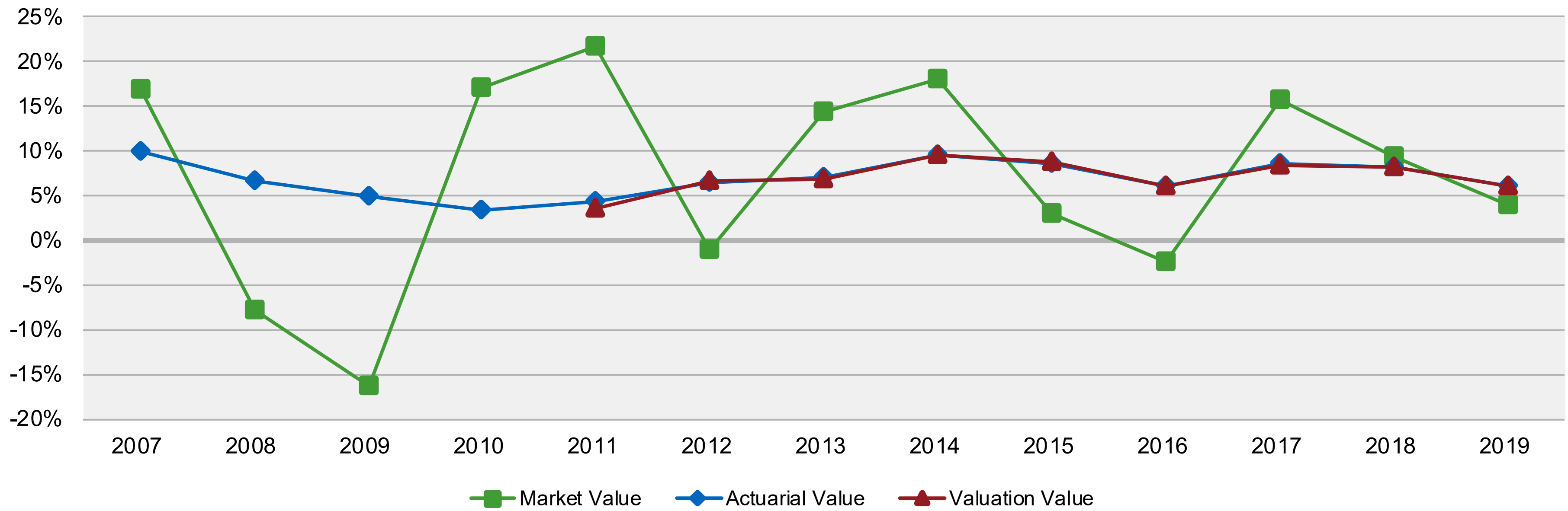
Year Ended June 30	Market Value Investment Return[2]		Actuarial Value Investment Return		Valuation Value Investment Return	
	Amount	Percent	Amount	Percent	Amount	Percent
2010	$44,658,046	17.00%	N/A	3.30%	N/A	N/A
2011	64,075,101	21.68%	$14,809,915	4.33%	$11,895,661	3.50%
2012	-4,078,489	-1.16%	22,205,173	6.38%	22,982,960	6.69%
2013	48,890,492	14.44%	25,124,178	6.95%	24,720,166	6.90%
2014	68,494,950	18.10%	36,055,066	9.54%	35,462,137	9.48%
2015	13,201,309	3.02%	34,687,586	8.59%	34,665,488	8.68%
2016	-10,352,325	-2.35%	25,892,595	6.04%	26,071,363	6.14%
2017	66,669,864	15.80%	38,015,912	8.51%	37,432,810	8.46%
2018	45,271,985	9.44%	38,812,527	8.16%	38,447,528	8.17%
2019	19,959,119	3.86%	30,330,266	5.99%	30,225,827	6.03%
Most recent five-year geometric average return		5.78%		7.45%		7.49%
Most recent ten-year geometric average return		9.68%		6.76%		N/A

(1) Information prior to 2011 has been extracted from the previous actuary's past valuation reports.

(2) The rates of return have been calculated on a dollar-weighted basis. It is our understanding that MCERA's investment consultant calculates rates of return on a time-weighted basis, which can produce different results.

Subsection B described the actuarial asset valuation method that gradually recognizes fluctuations in the market value rate of return. The goal of this is to stabilize the actuarial rate of return and to produce more level pension plan costs.

MARKET, ACTUARIAL AND VALUATION VALUE RATES OF RETURN FOR YEARS ENDED JUNE 30, 2007 – 2019



Contributions

Contributions for the year ended June 30, 2019 totaled $30.2 million, compared to the projected amount of $30.9 million. This resulted in a loss of $0.7 million for the year, when adjusted for timing.

Other Experience

There are other differences between the expected and the actual experience that appear when the new valuation is compared with the projections from the previous valuation. These include:

- the extent of turnover among participants,
- retirement experience (earlier or later than projected),
- mortality (more or fewer deaths than projected),
- the number of disability retirements (more or fewer than projected),
- salary increases (greater or smaller than projected), and
- COLAs higher or lower than anticipated.

The net loss from this other experience for the year ended June 30, 2019 amounted to $3.6 million, which is 0.49% of the Actuarial Accrued Liability. This loss was mainly due to higher than expected individual salary increases for actives. See *Subsection E* for a detailed development of the Unfunded Actuarial Accrued Liability.

D. Other Changes in the Actuarial Accrued Liability

The Actuarial Accrued Liability as of June 30, 2019 is $747.1 million, an increase of $29.6 million, or 4.1%, from the Actuarial Accrued Liability as of the prior valuation date. The liability is expected to grow each year with Normal Cost and interest, and to decline due to benefit payments made. Additional fluctuations can occur due to actual experience that differs from expected (as discussed in the previous subsection).

Actuarial Assumptions

- There are no assumption changes reflected in this report.
- Details on actuarial assumptions and methods are in *Section 4, Exhibit I*.

Plan Provisions

- There were no changes in plan provisions since the prior valuation.
- A summary of plan provisions is in *Section 4, Exhibit II*.

E. Development of Unfunded/(Overfunded) Actuarial Accrued Liability

DEVELOPMENT FOR YEAR ENDED JUNE 30, 2019

1	**Unfunded Actuarial Accrued Liability at beginning of year**		**$212,658,282**
2	Total Normal Cost at middle of year		14,055,000
3	Expected employer and member contributions		(29,872,071)
4	Interest		14,387,956
5	Expected Unfunded Actuarial Accrued Liability at end of year		$211,229,167
6	Changes due to: [1]		
	a) Investment return less than expected (after "smoothing")	$4,842,261	
	b) Individual salary increases higher than expected for continuing General, Safety, and Probation active members	5,294,765	
	c) Gain due to one-year delay in implementing employer contribution rates in the June 30, 2018 valuation[2]	(287,565)	
	d) Other experience gain[3]	(1,380,731)	
	Total changes		$8,468,730
7	**Unfunded Actuarial Accrued Liability at end of year**		**$219,697,897**

(1) The "net loss from other experience" of $3,626,469 from *Subsection C* is equal to the sum of items 6b, 6c, and 6d.

(2) The decrease in employer contribution rate attributable to this gain was included in the employer rate determined in the June 30, 2018 valuation.

(3) Includes primarily the effect of a refinement made inside the PensionGold system for identifying whether a beneficiary is eligible for a continuance benefit following a retired member's death. For the June 30, 2019 valuation, the form of payment changed from a joint and survivor annuity to a single life annuity for 68 members, including 55 General, 11 Safety, and 2 Probation members.

F. Recommended Contribution

The recommended contribution is equal to the employer Normal Cost payment and a payment on the Unfunded Actuarial Accrued Liability. As of June 30, 2019, the average recommended employer contribution is 34.56% of compensation.

The Board sets the funding policy used to calculate the recommended contribution based on layered amortization periods. See *Section 4, Exhibit I* for further details on the funding policy.

The contribution requirement as of June 30, 2019 is based on the data previously described, the actuarial assumptions and Plan provisions described in *Section 4*, including all changes affecting future costs adopted at the time of the actuarial valuation, actuarial gains and losses, and changes in the actuarial assumptions.

AVERAGE RECOMMENDED EMPLOYER CONTRIBUTION FOR YEAR ENDING JUNE 30

All Tiers Combined		2019		2018	
		Amount	% of Projected Compensation	Amount	% of Projected Compensation
1	Total Normal Cost	$14,263,000	20.05%	$14,055,000	20.68%
2	Expected member Normal Cost contributions	6,715,000	9.44%	6,560,000	9.65%
3	Employer Normal Cost: 1 - 2	$7,548,000	10.61%	$7,495,000	11.03%
4	Actuarial Accrued Liability	747,065,374		717,461,993	
5	Valuation Value of Assets	527,367,477		504,803,711	
6	Unfunded Actuarial Accrued Liability: 4 - 5	$219,697,897		$212,658,282	
7	Payment on Unfunded Actuarial Accrued Liability	$17,031,000[1]	23.95%	$15,796,000	23.24%
8	Total average recommended employer contribution: 3 + 7	$24,579,000	34.56%	$23,291,000	34.27%
9	Projected compensation	$71,124,175		$67,955,820	

[1] Based on the total annual payment in *Section 3, Exhibit I* plus an amount associated with the anticipated contribution rate impact resulting from the 12-month lag between the date of the valuation and the date of the contribution rate implementation.

Note: Contributions are assumed to be paid at the end of each pay period.

Reconciliation of Average Recommended Employer Contribution Rate

The chart below details the changes in the average recommended employer contribution from the prior valuation to the current year's valuation.

RECONCILIATION OF AVERAGE RECOMMENDED EMPLOYER CONTRIBUTION RATE FROM JUNE 30, 2018 TO JUNE 30, 2019

	Contribution Rate	Estimated Annual Dollar Amount[1]
Average Recommended Employer Contribution as of June 30, 2018	**34.13%**	**$24,276,000**
• Effect of change in membership demographics	(0.17)%	($118,000)
• Effect of anticipated one-year delay in implementing the higher aggregate employer contribution rate developed in the June 30, 2019 valuation until fiscal year 2020/2021	0.03%	21,000
• Effect of investment return less than expected	0.51%	363,000
• Effect of individual salary increases higher than expected for continuing General, Safety, and Probation active members	0.56%	398,000
• Effect of amortizing prior year's UAAL over a larger than expected projected total payroll	(0.26)%	(185,000)
• Effect of other net gains[2]	(0.24)%	(176,000)
Total change	0.43%	$303,000
Average Recommended Employer Contribution as of June 30, 2019	**34.56%**	**$24,579,000**

(1) Based on June 30, 2019 projected compensation.

(2) Includes primarily the effect of a refinement made inside the PensionGold system for identifying whether a beneficiary is eligible for a continuance benefit following a retired member's death. For the June 30, 2019 valuation, the form of payment changed from a joint and survivor annuity to a single life annuity for 68 members, including 55 General, 11 Safety, and 2 Probation members.

Reconciliation of Average Recommended Member Contribution

The chart below details the changes in the average recommended member contribution from the prior valuation to the current year's valuation.

RECONCILIATION OF AVERAGE RECOMMENDED MEMBER CONTRIBUTION FROM JUNE 30, 2018 TO JUNE 30, 2019

	Contribution Rate	Estimated Annual Dollar Amount[1]
Average Recommended Member Contribution as of June 30, 2018	**9.49%**	**$6,751,000**
• Effect of changes in member demographics	(0.05)%	$(36,000)
Total change	(0.05)%	$(36,000)
Average Recommended Member Contribution as of June 30, 2019	**9.44%**	**$6,715,000**

[1] Based on June 30, 2019 projected compensation.

Recommended Employer Contribution Rates (Estimated Annual Amounts in $000's)

	June 30, 2019 Actuarial Valuation				June 30, 2018 Actuarial Valuation			
	Basic Rate	COLA Rate	Total Rate	Estimated Annual Dollar Amount[1]	Basic Rate	COLA Rate	Total Rate	Estimated Annual Dollar Amount[1]
General Tier 1 Members								
Normal Cost	10.64%	3.47%	14.11%	$60	10.73%	3.52%	14.25%	$61
UAAL	19.35%	1.82%	21.17%	91	17.42%	2.74%	20.16%	86
Total Contributions	29.99%	5.29%	35.28%	$151	28.15%	6.26%	34.41%	$147
General Tier 2 / Tier 3 Members								
Normal Cost	7.96%	2.63%	10.59%	$3,001	8.09%	2.67%	10.76%	$3,049
UAAL	19.35%	1.82%	21.17%	5,998	17.42%	2.74%	20.16%	5,712
Total Contributions	27.31%	4.45%	31.76%	$8,999	25.51%	5.41%	30.92%	$8,761
General Tier 4 Members								
Normal Cost	7.46%	0.00%	7.46%	$2,141	7.58%	0.00%	7.58%	$2,175
UAAL	19.35%	1.82%	21.17%	6,075	17.42%	2.74%	20.16%	5,786
Total Contributions	26.81%	1.82%	28.63%	$8,216	25.00%	2.74%	27.74%	$7,961
Safety Tier 1 Members								
Normal Cost	Not Calculated[2]							
UAAL								
Total Contributions								
Safety Tier 2 Members								
Normal Cost	14.91%	6.52%	21.43%	$1,507	15.02%	6.58%	21.60%	$1,518
UAAL	30.36%	8.72%	39.08%	2,747	29.61%	11.74%	41.35%	2,907
Total Contributions	45.27%	15.24%	60.51%	$4,254	44.63%	18.32%	62.95%	$4,425
Safety Tier 3 Members								
Normal Cost	10.98%	0.00%	10.98%	$437	11.08%	0.00%	11.08%	$441
UAAL	30.36%	8.72%	39.08%	1,557	29.61%	11.74%	41.35%	1,648
Total Contributions	41.34%	8.72%	50.06%	$1,994	40.69%	11.74%	52.43%	$2,089

Recommended Employer Contribution Rates (continued) (Estimated Annual Amounts in $000's)

	June 30, 2019 Actuarial Valuation				June 30, 2018 Actuarial Valuation			
	Basic Rate	COLA Rate	Total Rate	Estimated Annual Dollar Amount[1]	Basic Rate	COLA Rate	Total Rate	Estimated Annual Dollar Amount[1]
Probation Tier 1 Members								
Normal Cost	Not Calculated[2]							
UAAL								
Total Contributions								
Probation Tier 2 Members								
Normal Cost	12.95%	4.71%	17.66%	$285	13.81%	4.85%	18.66%	$301
UAAL	24.20%	-2.94%[3]	21.26%	343	18.82%	-1.06%	17.76%	287
Total Contributions	37.15%	1.77%	38.92%	$628	32.63%	3.79%	36.42%	$588
Probation Tier 3 Members								
Normal Cost	11.30%	0.00%	11.30%	$117	11.74%	0.00%	11.74%	$121
UAAL	24.20%	-2.94%[3]	21.26%	220	18.82%	-1.06%	17.76%	184
Total Contributions	35.50%	-2.94%	32.56%	$337	30.56%	-1.06%	29.50%	$305
All Members Combined								
Normal Cost	8.79%	1.82%	10.61%	$7,548	8.93%	1.85%	10.78%	$7,666
UAAL	21.24%	2.71%	23.95%	17,031	19.37%	3.98%	23.35%	16,610
Total Contributions	30.03%	4.53%	34.56%	$24,579	28.30%	5.83%	34.13%	$24,276

(1) Amounts are based on the following June 30, 2019 projected annual compensation:

General Tier 1	$428,416
General Tier 2 / Tier 3	28,334,357
General Tier 4	28,698,807
Safety Tier 1	0
Safety Tier 2	7,029,932
Safety Tier 3	3,983,809
Probation Tier 1	0
Probation Tier 2	1,614,320
Probation Tier 3	1,034,534
Total	$71,124,175

(2) There were no Safety Tier 1 or Probation Tier 1 active members reported for the June 30, 2019 valuation.

(3) The negative COLA UAAL rate for the Probation group is an anomaly based on the reserve allocation method historically used by MCERA. Note, however, that the breakdown between basic and COLA portions does not affect the total employer rate payable for this group.

Note that a breakdown of the employer minimum dollar contribution to amortize the UAAL by membership group (General/Safety/Probation) and employer (County of Mendocino/Mendocino County Superior Court/Russian River Cemetery District) is provided on the next page.

Recommended Minimum Dollar Employer Contribution to Amortize the UAAL (Estimated Annual Amounts in $000's)

	June 30, 2019		
	Estimated UAAL Annual Amount[1]		
	Basic	COLA	Total
General Members			
County	$10,454	$984	$11,438
Courts	616	58	674
Cemetery District	48	4	52
Total	$11,118	$1,046	$12,164
Safety Members			
County	$3,344	$960	$4,304
Total	$3,344	$960	$4,304
Probation Members			
County	$641	-$78	$563
Total	$641	-$78	$563
All Members Combined			
County	$14,439	$1,866	$16,305
Courts	616	58	674
Cemetery District	48	4	52
Total	$15,103	$1,928	$17,031

(1) Amounts are based on the following June 30, 2019 projected annual compensation:

General County	$54,031,169
General Courts	3,183,191
General Cemetery District	247,220
Safety County	11,013,741
Probation County	2,648,854
Total	$71,124,175

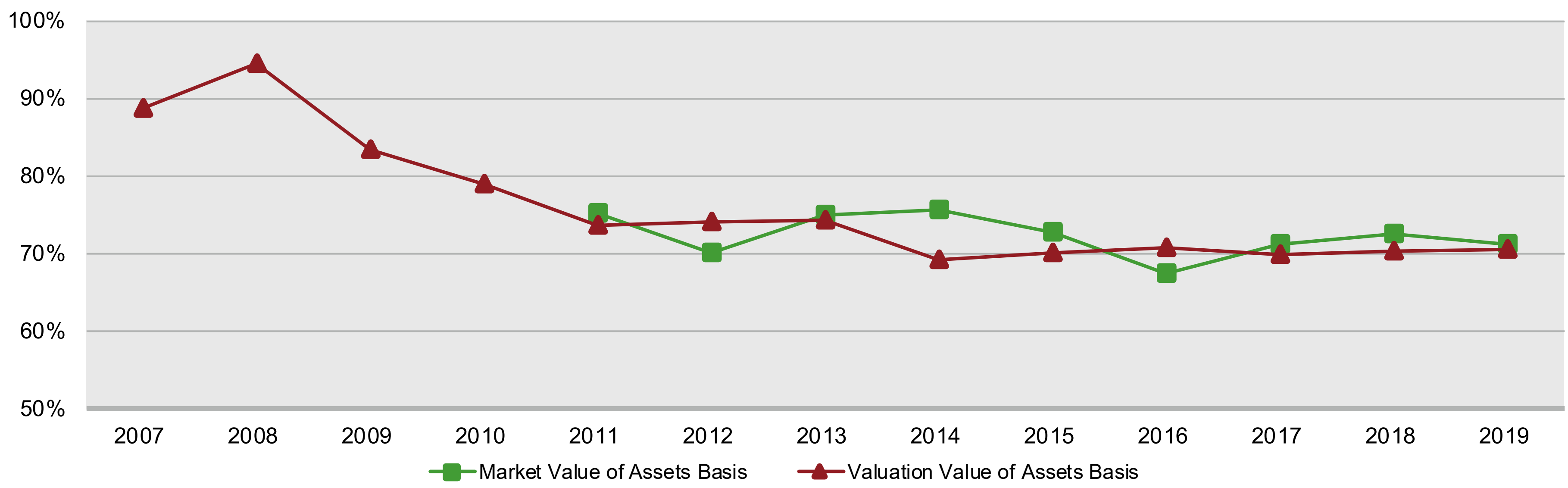
G. Funded Status

A commonly reported piece of information regarding the Plan's financial status is the funded ratio. These ratios compare the Market and Valuation Value of Assets to the Actuarial Accrued Liability of the Plan. High ratios indicate a well-funded plan with assets sufficient to cover the Plan's Actuarial Accrued Liability. Lower ratios may indicate recent changes to benefit structures, funding of the plan below actuarial requirements, poor asset performance, or a variety of other changes.

The chart below depicts a history of the funded ratio for the Plan. The chart on the next page shows the Plan's schedule of funding progress for the last ten years.

The funded status measures shown in this valuation are appropriate for assessing the need for or amount of future contributions. However, they are not necessarily appropriate for assessing the sufficiency of Plan assets to cover the estimated cost of settling the Plan's benefit obligations. As the chart below shows, the measures are different depending on whether the Valuation Value or Market Value of Assets is used.

FUNDED RATIO
FOR YEARS ENDING JUNE 30, 2007 – 2019



SCHEDULE OF FUNDING PROGRESS
FOR YEARS ENDING JUNE 30, 2010 – 2019[1]

Actuarial Valuation Date as of June 30,	Valuation Value of Assets[2] (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded/ (Overfunded) AAL (UAAL) (b) - (a)	Funded Ratio (%) (a) / (b)	Covered Payroll[3] (c)	UAAL as a Percentage of Covered Payroll (%) [(b) - (a)] / (c)
2010	$343,201,920	$434,986,533	$91,784,613	78.9%	$69,004,002	133.0%
2011	347,731,607	472,644,283	124,912,676	73.6	64,143,765	194.7
2012	362,487,345	489,014,364	126,527,019	74.1	56,596,088	223.6
2013	378,777,024	510,461,279	131,684,255	74.2	56,463,983	233.2
2014	404,855,842	584,428,884	179,573,042	69.3	55,876,248	321.4
2015	428,228,929	610,381,849	182,152,920	70.2	58,106,396	313.5
2016	446,773,272	632,057,539	185,284,267	70.7	61,214,954	302.7
2017	475,224,924	679,565,362	204,340,438	69.9	62,335,605	327.8
2018	504,803,711	717,461,993	212,658,282	70.4	67,955,820	312.9
2019	527,367,477	747,065,374	219,697,897	70.6	71,124,175	308.9

(1) Information prior to 2011 has been extracted from the previous actuary's past valuation reports.

(2) Excludes assets for non-valuation reserves.

(3) Beginning 6/30/2011, payroll includes a projection for expected salary increases during the year following the valuation date under the actuarial assumptions used in the valuation.

H. Actuarial Balance Sheet

An overview of the Plan's funding is given by an Actuarial Balance Sheet. In this approach, first the amount and timing of all future payments that will be made by the Plan for current participants is determined. Then these payments are discounted at the valuation interest rate to the date of the valuation, thereby determining the present value, referred to as the Actuarial Present Value of Future Benefits of the Plan.

Second, this Actuarial Present Value of Future Benefits is compared to the assets. The "assets" for this purpose include the net amount of assets already accumulated by the Plan, the present value of future member contributions, the present value of future employer Normal Cost contributions, and the present value of future employer amortization payments for the Unfunded Actuarial Accrued Liability.

ACTUARIAL BALANCE SHEET FOR YEAR ENDED JUNE 30, 2019

	Basic	COLA	Total
Actuarial Present Value of Future Benefits			
• Present value of benefits for retired members and beneficiaries	$288,762,242	$207,840,031	$496,602,273
• Present value of benefits for inactive vested members	26,192,412	8,807,052	34,999,464
• Present value of benefits for active members	226,354,884	66,029,972	292,384,856
Total Actuarial Present Value of Future Benefits	**$541,309,538**	**$282,677,055**	**$823,986,593**
Current and future assets			
• Total Valuation Value of Assets	$284,521,323	$242,846,154	$527,367,477
• Present value of future contributions by members	32,465,474	4,906,590	37,372,064
• Present value of future employer contributions for:			
» Entry age Normal Cost	33,158,479	6,390,676	39,549,155
» Unfunded Actuarial Accrued Liability	191,164,262	28,533,635	219,697,897
Total of current and future assets	**$541,309,538**	**$282,677,055**	**$823,986,593**

I. Volatility Ratios

Retirement plans are subject to volatility in the level of required contributions. This volatility tends to increase as retirement plans become more mature.

The Asset Volatility Ratio (AVR), which is equal to the Market Value of Assets divided by total payroll, provides an indication of the potential contribution volatility for any given level of investment volatility. A higher AVR indicates that the plan is subject to a greater level of contribution volatility. This is a current measurement since it is based on the current level of assets.

The current AVR is about 7.5. This means that a 1% asset gain or loss (relative to the assumed investment return) translates to about 7.5% of one-year's payroll. Since actuarial gains and losses are amortized over 18 years, there would be a 0.6% of payroll decrease/(increase) in the required contribution for each 1% asset gain/(loss).

The Liability Volatility Ratio (LVR), which is equal to the Actuarial Accrued Liability divided by payroll, provides an indication of the longer-term potential for contribution volatility for any given level of investment volatility. This is because, over an extended period of time, the plan's assets should track the plan's liabilities.

The LVR also indicates how volatile contributions will be in response to changes in the Actuarial Accrued Liability due to actual experience or to changes in actuarial assumptions. The current total plan LVR is about 10.5, but is 9.4 for General, 15.6 for Safety, and 13.0 for Probation. This means that assumption changes will have the greatest impact on employer contribution rates for Safety, followed by Probation and then General.

The chart on the next page shows how the asset and liability volatility ratios have varied over time.

VOLATILITY RATIOS FOR YEARS ENDED JUNE 30, 2010 – 2019[1]

Year Ended June 30	Asset Volatility Ratio				Liability Volatility Ratio			
	General	Safety	Probation	Total	General	Safety	Probation	Total
2010	4.1	5.8	5.3	4.3	5.7	10.0	6.1	6.3
2011	5.0	8.7	5.9	5.5	6.7	11.6	7.7	7.4
2012	5.6	8.7	5.6	6.1	8.1	12.3	7.8	8.6
2013	6.3	9.6	6.4	6.8	8.4	12.9	7.8	9.0
2014	7.4	10.6	7.9	7.9	9.7	14.6	9.6	10.5
2015	7.1	10.4	8.2	7.6	9.6	15.2	10.3	10.5
2016	6.4	9.8	7.8	7.0	9.4	15.4	10.5	10.3
2017	7.1	10.9	8.4	7.8	9.9	16.2	10.7	10.9
2018	6.9	11.1	9.4	7.7	9.5	16.1	11.6	10.6
2019	6.7	10.9	10.3	7.5	9.4	15.6	13.0	10.5

(1) Information for year ended June 30, 2010 has been derived based on information from the previous actuary's past valuation report.

J. Risk Assessment

Since the actuarial valuation results are dependent on a fixed set of assumptions and data as of a specific date, there is risk that emerging results may differ, perhaps significantly, as actual experience is fluid and will not exactly track current assumptions. This potential divergence may have a significant impact on the future financial condition of the plan.

This section does not contain a detailed analysis of the potential range of future measurements, but does include a concise discussion of some of the primary risks that may affect the Plan's future financial condition. We recommend a more detailed assessment of the risks to provide the Board with a better understanding of the risks inherent in the Plan that can inform both financial preparation and future decision making. This assessment would enable us to work with the Board to highlight and illustrate particular risks or potential future outcomes it may be interested in discussing and could include tailored scenario testing, sensitivity testing, stress testing and stochastic modeling.

This section provides descriptions and basic assessments of the primary risks that are likely to have an ongoing influence on the Plan's financial health, as well as a discussion of historical trends and maturity measures.

Risk Assessments

- Asset/Liability Mismatch Risk (the potential that future plan experience does not affect asset and liability values in the same way, causing them to diverge)

  The most significant asset/liability mismatch risk to the Plan is investment risk, as discussed below. In fact, investment risk has the potential to impact asset/liability mismatch in two ways. The first mismatch is evident in annual valuations: when asset values deviate from assumptions, they are typically independent from liability changes. The second mismatch can be caused when systemic asset deviations from assumptions may signal the need for an assumption change, which causes liability values and contribution rates to move in the opposite direction from any changes in the expected experience of asset growth rates.

  Asset/liability mismatch can also be caused by demographic assumption risk such as longevity, which affects liabilities but have no impact on asset levels. This risk is also discussed below.

- Investment Risk (the risk that investment returns will be different than expected)

  The investment return assumption is a long-term, static assumption for valuation purposes even though in reality market experience can be quite volatile in any given year. That volatility can cause significant changes in the financial health of the association, affecting both funded status and contribution rates. The inherent year-to-year volatility is reduced by smoothing through the Actuarial Value of Assets, however investment experience can still have a sizable impact. As discussed in *Section 2, Subsection I, Volatility Ratios,* on page 39, a 1% asset gain or loss (relative to the assumed investment return) translates to about 7.5% of one-year's payroll. Since actuarial gains and losses are amortized over 18 years, there would be a 0.6% of payroll decrease/(increase) in the required contribution for each 1% asset gain or loss.

The single year market value rate of return over the last 10 years has ranged from a low of -2.35% to a high of 21.68%.

- Longevity Risk (the risk that mortality experience will be different than expected)

  The actuarial valuation includes current life expectancy assumptions and an expectation of future improvement in life expectancy, which are significant assumptions given the relatively long duration of liabilities for pension plans. Emerging plan experience that does not match these expectations will result in increases or decreases in the actuarially determined contribution over time. This risk can be reduced by using tables appropriate for the Plan (public experience tables) that are weighted by benefit levels, and by using generational mortality projections. We will be discussing the use of such mortality tables with the Board for the upcoming triennial experience study before we complete our next valuation as of June 30, 2020.

- Other Risks

  In addition to longevity, the valuation includes a variety of other assumptions that are unlikely to match future experience exactly. One example is projected salary scales over time. As salary is central to the determination of benefits paid in retirement, deviations from the projected salary scales could have a material impact on the benefits anticipated for each member. Examples of demographic assumptions include retirement, termination and disability assumptions, and will likely vary in significance for different cost groups (for example, disability assumptions are typically more significant for safety groups).

Some plans also carry significant contribution risk, defined as the potential for actual future contributions deviating from expected future contributions. However, the employers have a proven track-record of making the Actuarially Determined Contributions based on the Board's Actuarial Funding Policy, so contribution risk is minimal.

Evaluation of Historical Trends

Past experience can help demonstrate the sensitivity of key results to the Plan's actual experience.

- Over the past ten years, the funded percentage on the Valuation Value of Assets basis has decreased from 78.9% to 70.6%. This is primarily due to changes in the actuarial assumptions. For a more detailed history see *Section 2, Subsection G, Funded Status* starting on page 36.

- The average geometric investment return on the Valuation Value of Assets over the last 9 years was 7.10%[2]. This includes a high of a 9.48% return and a low of 3.50%. The average over the last 5 years was 7.49%. For more details see the Investment Return table in *Section 2, Subsection B* on page 25.
- The primary source of new UAAL was the strengthening of assumptions through multiple assumption changes. For example, the assumption change in 2017 changed the discount rate from 7.25% to 7.00% and updated mortality tables, adding $28 million in unfunded liability. The assumption change in 2014 changed the discount rate from 7.75% to 7.25%, adding $57 million in unfunded liability. For more details on the unfunded liability changes see *Section 3, Exhibit I, Table of Amortization Bases* starting on page 70.
- The plan's funding policy effectively deals with these unfunded liabilities over time. This can be seen most clearly in *Section 3, Exhibit J, Projection of UAAL Balances and Payments* provided on pages 72 and 73.

Maturity Measures

In the last 10 years the ratio of members in pay status to active participants has increased from 0.86 to 1.35. An increased ratio indicates that the plan has grown in maturity over time. This is to be expected, but is also informative for understanding plan sensitivity to particular risks. For more details see *Section 2, Subsection A, Member Data* on page 15.

As pension plans mature, the cash needed to fulfill benefit obligations will increase over time. Therefore, cash flow projections and analysis should be performed to assure that the Plan's asset allocation is aligned to meet emerging pension liabilities. For the prior year benefits paid were $6 million more than contributions received. Plans with high levels of negative cash flows may have a need for a larger allocation to income generating assets, which can create a drag on investment return. However, this plan currently has relatively low levels of negative cash flows. For more details on historical cash flows see the Comparison of Contributions with Benefits in *Section 2, Subsection B, Financial Information* on page 19.

A further discussion of plan maturity measures and how they relate to changes in assets and liabilities is included in *Section 2, Subsection I, Volatility Ratios* starting on page 39.

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[2] The VVA return for the year ended June 30, 2010 was not provided in the prior actuary's past valuation reports, so only 9 years of returns are available.

EXHIBIT A – TABLE OF PLAN COVERAGE
TOTAL PLAN

Category	Year Ended June 30		Change From Prior Year
	2019	2018	
Active members in valuation:			
• Number	1,151	1,162	-0.9%
• Average age	45.9	46.5	-0.6
• Average years of service	8.6	8.8	-0.2
• Total projected compensation	$71,124,175	$67,955,820	4.7%
• Average projected compensation	$61,793	$58,482	5.7%
• Account balances	$55,478,407	$54,154,219	2.4%
• Total active vested members	581	588	-1.2%
Inactive vested members:			
• Number	515	497	3.6%
• Average age	46.5	46.4	0.1
Retired members:			
• Number in pay status	1,218	1,161	4.9%
• Average age	69.6	69.4	0.2
• Average monthly benefit	$1,978	$1,918	3.1%
Disabled members:			
• Number in pay status	178	176	1.1%
• Average age	66.2	65.7	0.5
• Average monthly benefit	$2,514	$2,435	3.2%
Beneficiaries:			
• Number in pay status	156	153	2.0%
• Average age	72.1	72.4	-0.3
• Average monthly benefit	$1,383	$1,335	3.6%

EXHIBIT A – TABLE OF PLAN COVERAGE (CONTINUED)
GENERAL TIER 1

Category	Year Ended June 30 2019	Year Ended June 30 2018	Change From Prior Year
Active members in valuation:			
• Number	4	7	-42.9%
• Average age	62.3	61.2	1.1
• Average years of service	32.7	32.6	0.1
• Total projected compensation	$428,416	$581,818	-26.4%
• Average projected compensation	$107,104	$83,117	28.9%
• Account balances	$1,035,863	$1,479,069	-30.0%
• Total active vested members	4	7	-42.9%
Inactive vested members:			
• Number	1	2	-50.0%
• Average age	51.0	56.2	-5.2
Retired members:			
• Number in pay status	285	288	-1.0%
• Average age	76.2	75.7	0.5
• Average monthly benefit	$2,812	$2,689	4.6%
Disabled members:			
• Number in pay status	27	28	-3.6%
• Average age	73.6	73.4	0.2
• Average monthly benefit	$2,147	$2,099	2.3%
Beneficiaries:			
• Number in pay status	63	67	-6.0%
• Average age	78.5	79.2	-0.7
• Average monthly benefit	$1,520	$1,443	5.3%

EXHIBIT A – TABLE OF PLAN COVERAGE (CONTINUED)
GENERAL TIERS 2 AND 3

Category	Year Ended June 30 2019	Year Ended June 30 2018	Change From Prior Year
Active members in valuation:			
• Number	419	468	-10.5%
• Average age	52.9	52.7	0.2
• Average years of service	15.3	14.6	0.7
• Total projected compensation	$28,334,357	$29,724,088	-4.7%
• Average projected compensation	$67,624	$63,513	6.5%
• Account balances	$37,416,860	$37,555,431	-0.4%
• Total active vested members	395	441	-10.4%
Inactive vested members:			
• Number	273	282	-3.2%
• Average age	49.7	49.6	0.1
Retired members:			
• Number in pay status	780	741	5.3%
• Average age	68.1	67.7	0.4
• Average monthly benefit	$1,479	$1,414	4.6%
Disabled members:			
• Number in pay status	84	83	1.2%
• Average age	64.3	63.4	0.9
• Average monthly benefit	$1,798	$1,751	2.7%
Beneficiaries:			
• Number in pay status	55	48	14.6%
• Average age	67.4	66.9	0.5
• Average monthly benefit	$1,020	$926	10.2%

EXHIBIT A – TABLE OF PLAN COVERAGE (CONTINUED)
GENERAL TIER 4

Category	Year Ended June 30 2019	Year Ended June 30 2018	Change From Prior Year
Active members in valuation:			
• Number	548	507	8.1%
• Average age	42.2	42.5	-0.3
• Average years of service	2.6	2.3	0.3
• Total projected compensation	$28,698,807	$24,626,352	16.5%
• Average projected compensation	$52,370	$48,573	7.8%
• Account balances	$5,172,034	$3,771,670	37.1%
• Total active vested members	75	28	167.9%
Inactive vested members:			
• Number	177	150	18.0%
• Average age	43.9	43.1	0.8
Retired members:			
• Number in pay status	7	1	600.0%
• Average age	65.6	76.8	-11.2
• Average monthly benefit	$618	$774	-20.2%
Disabled members:			
• Number in pay status	N/A	N/A	N/A
• Average age	N/A	N/A	N/A
• Average monthly benefit	N/A	N/A	N/A
Beneficiaries:			
• Number in pay status	N/A	N/A	N/A
• Average age	N/A	N/A	N/A
• Average monthly benefit	N/A	N/A	N/A

EXHIBIT A – TABLE OF PLAN COVERAGE (CONTINUED)
SAFETY TIERS 1 AND 2

Category	Year Ended June 30 2019	Year Ended June 30 2018	Change From Prior Year
Active members in valuation:			
• Number	72	79	-8.9%
• Average age	48.1	47.6	0.5
• Average years of service	18.8	18.2	0.6
• Total projected compensation	$7,029,932	$7,205,516	-2.4%
• Average projected compensation	$97,638	$91,209	7.0%
• Account balances	$7,850,114	$7,532,544	4.2%
• Total active vested members	69	77	-10.4%
Inactive vested members:			
• Number	31	34	-8.8%
• Average age	44.0	44.1	-0.1
Retired members:			
• Number in pay status	103	94	9.6%
• Average age	65.0	65.3	-0.3
• Average monthly benefit	$3,174	$3,113	2.0%
Disabled members:			
• Number in pay status	63	62	1.6%
• Average age	66.2	65.6	0.6
• Average monthly benefit	$3,641	$3,518	3.5%
Beneficiaries:			
• Number in pay status	35	36	-2.8%
• Average age	67.9	67.0	0.9
• Average monthly benefit	$1,709	$1,691	1.1%

EXHIBIT A – TABLE OF PLAN COVERAGE (CONTINUED)
SAFETY TIER 3

Category	Year Ended June 30		Change From Prior Year
	2019	2018	
Active members in valuation:			
• Number	65	52	25.0%
• Average age	31.6	31.2	0.4
• Average years of service	2.8	2.4	0.4
• Total projected compensation	$3,983,809	$3,004,546	32.6%
• Average projected compensation	$61,289	$57,780	6.1%
• Account balances	$1,133,161	$733,742	54.4%
• Total active vested members	11	4	175.0%
Inactive vested members:			
• Number	11	10	10.0%
• Average age	32.6	32.5	0.1
Retired members:			
• Number in pay status	N/A	N/A	N/A
• Average age	N/A	N/A	N/A
• Average monthly benefit	N/A	N/A	N/A
Disabled members:			
• Number in pay status	N/A	N/A	N/A
• Average age	N/A	N/A	N/A
• Average monthly benefit	N/A	N/A	N/A
Beneficiaries:			
• Number in pay status	N/A	N/A	N/A
• Average age	N/A	N/A	N/A
• Average monthly benefit	N/A	N/A	N/A

EXHIBIT A – TABLE OF PLAN COVERAGE (CONTINUED)
PROBATION TIERS 1 AND 2

Category	Year Ended June 30		Change From Prior Year
	2019	2018	
Active members in valuation:			
• Number	22	29	-24.1%
• Average age	46.5	47.3	-0.8
• Average years of service	14.7	13.3	1.4
• Total projected compensation	$1,614,320	$1,856,491	-13.0%
• Average projected compensation	$73,378	$64,017	14.6%
• Account balances	$2,570,565	$2,880,053	-10.7%
• Total active vested members	22	29	-24.1%
Inactive vested members:			
• Number	17	15	13.3%
• Average age	40.8	39.2	1.6
Retired members:			
• Number in pay status	43	37	16.2%
• Average age	65.5	64.9	0.6
• Average monthly benefit	$2,843	$2,993	-5.0%
Disabled members:			
• Number in pay status	4	3	33.3%
• Average age	57.3	58.8	-1.5
• Average monthly benefit	$2,269	$2,124	6.8%
Beneficiaries:			
• Number in pay status	3	2	50.0%
• Average age	71.4	73.4	-2.0
• Average monthly benefit	$1,362	$1,084	25.6%

EXHIBIT A – TABLE OF PLAN COVERAGE (CONTINUED)
PROBATION TIER 3

Category	Year Ended June 30 2019	Year Ended June 30 2018	Change From Prior Year
Active members in valuation:			
• Number	21	20	5.0%
• Average age	33.4	33.7	-0.3
• Average years of service	3.0	2.4	0.6
• Total projected compensation	$1,034,534	$957,009	8.1%
• Average projected compensation	$49,264	$47,850	3.0%
• Account balances	$299,810	$201,710	48.6%
• Total active vested members	5	2	150.0%
Inactive vested members:			
• Number	5	4	25.0%
• Average age	30.0	29.0	1.0
Retired members:			
• Number in pay status	N/A	N/A	N/A
• Average age	N/A	N/A	N/A
• Average monthly benefit	N/A	N/A	N/A
Disabled members:			
• Number in pay status	N/A	N/A	N/A
• Average age	N/A	N/A	N/A
• Average monthly benefit	N/A	N/A	N/A
Beneficiaries:			
• Number in pay status	N/A	N/A	N/A
• Average age	N/A	N/A	N/A
• Average monthly benefit	N/A	N/A	N/A

EXHIBIT B – MEMBERS IN ACTIVE SERVICE AS OF JUNE 30, 2019
BY AGE, YEARS OF SERVICE, AND AVERAGE PROJECTED COMPENSATION
TOTAL PLAN

		Years of Service								
Age	Total	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 & over
Under 25	43	43	- -	- -	- -	- -	- -	- -	- -	- -
	$42,083	$42,083	- -	- -	- -	- -	- -	- -	- -	- -
25 - 29	112	101	11	- -	- -	- -	- -	- -	- -	- -
	50,008	49,399	$55,604	- -	- -	- -	- -	- -	- -	- -
30 - 34	123	86	28	8	1	- -	- -	- -	- -	- -
	54,528	51,008	61,543	$69,011	$45,019	- -	- -	- -	- -	- -
35 - 39	128	73	25	26	4	- -	- -	- -	- -	- -
	59,452	51,395	63,386	75,786	75,733	- -	- -	- -	- -	- -
40 - 44	115	52	20	21	15	7	- -	- -	- -	- -
	62,522	54,130	57,901	74,389	76,736	$72,002	- -	- -	- -	- -
45 - 49	159	67	17	24	26	22	3	- -	- -	- -
	65,483	53,922	63,071	70,192	77,658	80,225	$86,066	- -	- -	- -
50 - 54	157	53	16	21	27	21	15	3	1	- -
	68,639	60,892	61,437	58,992	67,939	83,366	86,195	$98,854	$152,676	- -
55 - 59	153	54	18	24	25	21	4	6	1	- -
	67,111	62,835	62,690	62,107	72,329	69,818	57,325	101,923	140,668	- -
60 - 64	109	29	11	25	19	13	6	4	2	- -
	67,074	56,194	80,563	67,027	66,267	70,850	65,650	77,992	116,800	- -
65 - 69	41	9	9	9	9	1	3	1	- -	- -
	66,517	65,140	67,790	57,414	68,839	54,462	79,448	101,741	- -	- -
70 & over	11	3	1	5	1	1	- -	- -	- -	- -
	64,769	55,414	68,690	70,783	46,116	77,501	- -	- -	- -	- -
Total	**1,151**	**570**	**156**	**163**	**127**	**86**	**31**	**14**	**4**	**- -**
	$61,793	**$53,276**	**$62,988**	**$67,761**	**$71,539**	**$76,033**	**$77,828**	**$94,415**	**$131,736**	**- -**

EXHIBIT B – MEMBERS IN ACTIVE SERVICE AS OF JUNE 30, 2019 (CONTINUED)
BY AGE, YEARS OF SERVICE, AND AVERAGE PROJECTED COMPENSATION
GENERAL TIER 1

		Years of Service								
Age	Total	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 & over
Under 25	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
25 - 29	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
30 - 34	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
35 - 39	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
40 - 44	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
45 - 49	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
50 - 54	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
55 - 59	1	- -	- -	- -	- -	- -	- -	- -	1	- -
	$140,668	- -	- -	- -	- -	- -	- -	- -	$140,668	- -
60 - 64	3	- -	- -	- -	1	- -	- -	- -	2	- -
	95,916	- -	- -	- -	$54,148	- -	- -	- -	116,800	- -
65 - 69	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
70 & over	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
Total	**4**	**- -**	**- -**	**- -**	**1**	**- -**	**- -**	**- -**	**3**	**- -**
	$107,104	**- -**	**- -**	**- -**	**$54,148**	**- -**	**- -**	**- -**	**$124,756**	**- -**

EXHIBIT B – MEMBERS IN ACTIVE SERVICE AS OF JUNE 30, 2019 (CONTINUED)
BY AGE, YEARS OF SERVICE, AND AVERAGE PROJECTED COMPENSATION
GENERAL TIERS 2 AND 3

		Years of Service								
Age	**Total**	**0 - 4**	**5 - 9**	**10 - 14**	**15 - 19**	**20 - 24**	**25 - 29**	**30 - 34**	**35 - 39**	**40 & over**
Under 25	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
25 - 29	2	- -	2	- -	- -	- -	- -	- -	- -	- -
	$60,306	- -	$60,306	- -	- -	- -	- -	- -	- -	- -
30 - 34	13	3	4	5	1	- -	- -	- -	- -	- -
	58,522	$65,856	54,076	$60,379	$45,019	- -	- -	- -	- -	- -
35 - 39	33	3	8	19	3	- -	- -	- -	- -	- -
	69,863	63,154	67,057	71,246	75,295	- -	- -	- -	- -	- -
40 - 44	40	1	7	15	12	5	- -	- -	- -	- -
	67,741	63,707	53,716	72,705	73,109	$60,406	- -	- -	- -	- -
45 - 49	63	4	6	21	17	12	3	- -	- -	- -
	68,956	74,154	66,083	68,065	70,925	63,150	$86,066	- -	- -	- -
50 - 54	79	5	9	20	22	11	11	1	- -	- -
	67,027	102,950	69,589	57,333	63,025	70,292	72,052	$55,066	- -	- -
55 - 59	85	6	8	22	22	19	4	4	- -	- -
	66,037	62,505	63,637	60,564	71,471	66,427	57,325	83,212	- -	- -
60 - 64	69	1	6	23	17	13	6	3	- -	- -
	71,071	59,771	103,429	66,369	68,007	70,850	65,650	75,335	- -	- -
65 - 69	27	1	5	9	8	1	3	- -	- -	- -
	64,269	56,713	65,087	57,414	67,947	54,462	79,448	- -	- -	- -
70 & over	8	- -	1	5	1	1	- -	- -	- -	- -
	68,278	- -	68,690	70,783	46,116	77,501	- -	- -	- -	- -
Total	**419**	**24**	**56**	**139**	**103**	**62**	**27**	**8**	**- -**	**- -**
	$67,624	**$73,067**	**$67,785**	**$65,120**	**$68,531**	**$66,906**	**$70,826**	**$76,740**	**- -**	**- -**

EXHIBIT B – MEMBERS IN ACTIVE SERVICE AS OF JUNE 30, 2019 (CONTINUED)
BY AGE, YEARS OF SERVICE, AND AVERAGE PROJECTED COMPENSATION
GENERAL TIER 4

	Years of Service									
Age	Total	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 & over
Under 25	35	35	- -	- -	- -	- -	- -	- -	- -	- -
	$39,489	$39,489	- -	- -	- -	- -	- -	- -	- -	- -
25 - 29	74	67	7	- -	- -	- -	- -	- -	- -	- -
	46,143	45,517	$52,134	- -	- -	- -	- -	- -	- -	- -
30 - 34	79	68	11	- -	- -	- -	- -	- -	- -	- -
	50,038	48,856	57,345	- -	- -	- -	- -	- -	- -	- -
35 - 39	74	61	13	- -	- -	- -	- -	- -	- -	- -
	50,802	48,904	59,710	- -	- -	- -	- -	- -	- -	- -
40 - 44	59	49	10	- -	- -	- -	- -	- -	- -	- -
	54,682	54,229	56,900	- -	- -	- -	- -	- -	- -	- -
45 - 49	72	62	10	- -	- -	- -	- -	- -	- -	- -
	53,790	52,555	61,450	- -	- -	- -	- -	- -	- -	- -
50 - 54	52	45	7	- -	- -	- -	- -	- -	- -	- -
	55,378	56,066	50,956	- -	- -	- -	- -	- -	- -	- -
55 - 59	56	47	9	- -	- -	- -	- -	- -	- -	- -
	61,794	62,330	58,996	- -	- -	- -	- -	- -	- -	- -
60 - 64	33	28	5	- -	- -	- -	- -	- -	- -	- -
	55,621	56,067	53,124	- -	- -	- -	- -	- -	- -	- -
65 - 69	11	8	3	- -	- -	- -	- -	- -	- -	- -
	68,067	66,193	73,064	- -	- -	- -	- -	- -	- -	- -
70 & over	3	3	- -	- -	- -	- -	- -	- -	- -	- -
	55,414	55,414	- -	- -	- -	- -	- -	- -	- -	- -
Total	**548**	**473**	**75**	**- -**	**- -**	**- -**	**- -**	**- -**	**- -**	**- -**
	$52,370	**$51,524**	**$57,706**	**- -**	**- -**	**- -**	**- -**	**- -**	**- -**	**- -**

EXHIBIT B – MEMBERS IN ACTIVE SERVICE AS OF JUNE 30, 2019 (CONTINUED)
BY AGE, YEARS OF SERVICE, AND AVERAGE PROJECTED COMPENSATION
SAFETY TIERS 1 AND 2

		Years of Service								
Age	Total	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 & over
Under 25	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
25 - 29	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
30 - 34	6	1	3	2	- -	- -	- -	- -	- -	- -
	$83,535	$77,537	$80,475	$91,123	- -	- -	- -	- -	- -	- -
35 - 39	7	2	1	4	- -	- -	- -	- -	- -	- -
	88,552	88,713	82,720	89,930	- -	- -	- -	- -	- -	- -
40 - 44	8	- -	1	4	1	2	- -	- -	- -	- -
	92,996	- -	104,930	81,996	$109,070	$100,992	- -	- -	- -	- -
45 - 49	18	- -	- -	2	7	9	- -	- -	- -	- -
	97,242	- -	- -	85,297	92,571	103,529	- -	- -	- -	- -
50 - 54	22	- -	- -	1	5	9	4	2	1	- -
	106,092	- -	- -	92,187	89,560	99,945	$125,090	$120,749	$152,676	- -
55 - 59	6	- -	- -	1	1	2	- -	2	- -	- -
	111,276	- -	- -	93,585	91,326	102,027	- -	139,345	- -	- -
60 - 64	3	- -	- -	2	- -	- -	- -	1	- -	- -
	78,381	- -	- -	74,592	- -	- -	- -	85,961	- -	- -
65 - 69	2	- -	- -	- -	1	- -	- -	1	- -	- -
	88,856	- -	- -	- -	75,972	- -	- -	101,741	- -	- -
70 & over	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
Total	**72**	**3**	**5**	**16**	**15**	**22**	**4**	**6**	**1**	**- -**
	$97,638	**$84,987**	**$85,815**	**$85,968**	**$91,478**	**$101,696**	**$125,090**	**$117,981**	**$152,676**	**- -**

EXHIBIT B – MEMBERS IN ACTIVE SERVICE AS OF JUNE 30, 2019 (CONTINUED)
BY AGE, YEARS OF SERVICE, AND AVERAGE PROJECTED COMPENSATION
SAFETY TIER 3

	Years of Service									
Age	Total	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 & over
Under 25	7	7	- -	- -	- -	- -	- -	- -	- -	- -
	$55,238	$55,238	- -	- -	- -	- -	- -	- -	- -	- -
25 - 29	28	27	1	- -	- -	- -	- -	- -	- -	- -
	59,470	59,038	$71,114	- -	- -	- -	- -	- -	- -	- -
30 - 34	17	11	6	- -	- -	- -	- -	- -	- -	- -
	61,874	59,135	66,894	- -	- -	- -	- -	- -	- -	- -
35 - 39	7	5	2	- -	- -	- -	- -	- -	- -	- -
	62,338	59,996	68,194	- -	- -	- -	- -	- -	- -	- -
40 - 44	1	- -	1	- -	- -	- -	- -	- -	- -	- -
	65,475	- -	65,475	- -	- -	- -	- -	- -	- -	- -
45 - 49	1	1	- -	- -	- -	- -	- -	- -	- -	- -
	57,791	57,791	- -	- -	- -	- -	- -	- -	- -	- -
50 - 54	2	2	- -	- -	- -	- -	- -	- -	- -	- -
	71,785	71,785	- -	- -	- -	- -	- -	- -	- -	- -
55 - 59	2	1	1	- -	- -	- -	- -	- -	- -	- -
	88,469	88,575	88,362	- -	- -	- -	- -	- -	- -	- -
60 - 64	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
65 - 69	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
70 & over	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
Total	**65**	**54**	**11**	**- -**	**- -**	**- -**	**- -**	**- -**	**- -**	**- -**
	$61,289	**$59,650**	**$69,336**	**- -**	**- -**	**- -**	**- -**	**- -**	**- -**	**- -**

EXHIBIT B – MEMBERS IN ACTIVE SERVICE AS OF JUNE 30, 2019 (CONTINUED)
BY AGE, YEARS OF SERVICE, AND AVERAGE PROJECTED COMPENSATION
PROBATION TIERS 1 AND 2

		Years of Service								
Age	Total	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 & over
Under 25	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
25 - 29	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
30 - 34	2	- -	1	1	- -	- -	- -	- -	- -	- -
	$65,585	- -	$63,219	$67,951	- -	- -	- -	- -	- -	- -
35 - 39	5	- -	1	3	1	- -	- -	- -	- -	- -
	77,391	- -	52,863	85,681	$77,046	- -	- -	- -	- -	- -
40 - 44	4	- -	- -	2	2	- -	- -	- -	- -	- -
	77,067	- -	- -	71,805	82,329	- -	- -	- -	- -	- -
45 - 49	5	- -	1	1	2	1	- -	- -	- -	- -
	77,322	- -	61,201	84,633	82,692	$75,393	- -	- -	- -	- -
50 - 54	1	- -	- -	- -	- -	1	- -	- -	- -	- -
	77,958	- -	- -	- -	- -	77,958	- -	- -	- -	- -
55 - 59	3	- -	- -	1	2	- -	- -	- -	- -	- -
	69,692	- -	- -	64,553	72,261	- -	- -	- -	- -	- -
60 - 64	1	- -	- -	- -	1	- -	- -	- -	- -	- -
	48,806	- -	- -	- -	48,806	- -	- -	- -	- -	- -
65 - 69	1	- -	1	- -	- -	- -	- -	- -	- -	- -
	65,481	- -	65,481	- -	- -	- -	- -	- -	- -	- -
70 & over	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
Total	**22**	**- -**	**4**	**8**	**8**	**2**	**- -**	**- -**	**- -**	**- -**
	$73,378	**- -**	**$60,691**	**$77,224**	**$75,052**	**$76,676**	**- -**	**- -**	**- -**	**- -**

EXHIBIT B – MEMBERS IN ACTIVE SERVICE AS OF JUNE 30, 2019 (CONTINUED)
BY AGE, YEARS OF SERVICE, AND AVERAGE PROJECTED COMPENSATION
PROBATION TIER 3

		Years of Service								
Age	**Total**	**0 - 4**	**5 - 9**	**10 - 14**	**15 - 19**	**20 - 24**	**25 - 29**	**30 - 34**	**35 - 39**	**40 & over**
Under 25	1	1	- -	- -	- -	- -	- -	- -	- -	- -
	$40,758	$40,758	- -	- -	- -	- -	- -	- -	- -	- -
25 - 29	8	7	1	- -	- -	- -	- -	- -	- -	- -
	50,073	49,372	$54,985	- -	- -	- -	- -	- -	- -	- -
30 - 34	6	3	3	- -	- -	- -	- -	- -	- -	- -
	51,491	46,277	56,705	- -	- -	- -	- -	- -	- -	- -
35 - 39	2	2	- -	- -	- -	- -	- -	- -	- -	- -
	50,900	50,900	- -	- -	- -	- -	- -	- -	- -	- -
40 - 44	3	2	1	- -	- -	- -	- -	- -	- -	- -
	45,488	46,932	42,601	- -	- -	- -	- -	- -	- -	- -
45 - 49	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
50 - 54	1	1	- -	- -	- -	- -	- -	- -	- -	- -
	45,978	45,978	- -	- -	- -	- -	- -	- -	- -	- -
55 - 59	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
60 - 64	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
65 - 69	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
70 & over	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
Total	**21**	**16**	**5**	**- -**	**- -**	**- -**	**- -**	**- -**	**- -**	**- -**
	$49,264	**$47,927**	**$53,540**	**- -**	**- -**	**- -**	**- -**	**- -**	**- -**	**- -**

EXHIBIT C – SCHEDULE OF AVERAGE BENEFIT PAYMENT AMOUNTS

	Number of Years Since Retirement						
	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 & Over
Valuation date: 6/30/2012							
Average monthly benefit of retirees	$1,841	$1,752	$1,420	$1,462	$1,640	$1,336	$1,356
Number of retirees	382	277	132	99	85	62	38
Average monthly benefit of beneficiaries	$1,167	$1,230	$806	$1,385	$1,324	$1,150	$975
Number of beneficiaries	44	42	19	14	8	8	7
Valuation date: 6/30/2013							
Average monthly benefit of retirees	$1,874	$1,870	$1,391	$1,480	$1,706	$1,377	$1,458
Number of retirees	407	300	148	106	86	52	44
Average monthly benefit of beneficiaries	$1,207	$1,236	$882	$1,248	$1,442	$1,177	$871
Number of beneficiaries	46	38	19	20	7	8	6
Valuation date: 6/30/2014							
Average monthly benefit of retirees	$1,928	$1,916	$1,433	$1,575	$1,668	$1,517	$1,481
Number of retirees	411	318	155	112	90	50	48
Average monthly benefit of beneficiaries	$1,265	$1,228	$1,064	$954	$1,786	$1,300	$699
Number of beneficiaries	41	39	22	19	8	9	6
Valuation date: 6/30/2015							
Average monthly benefit of retirees	$1,986	$2,006	$1,587	$1,570	$1,753	$1,457	$1,610
Number of retirees	391	329	200	110	94	51	52
Average monthly benefit of beneficiaries	$1,308	$1,208	$1,184	$961	$1,654	$1,226	$1,091
Number of beneficiaries	46	40	23	16	12	8	7

EXHIBIT C – SCHEDULE OF AVERAGE BENEFIT PAYMENT AMOUNTS (CONTINUED)

	Number of Years Since Retirement						
	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 & Over
Valuation date: 6/30/2016							
Average monthly benefit of retirees	$1,987	$2,057	$1,831	$1,596	$1,553	$1,742	$1,711
Number of retirees	388	337	222	118	92	53	52
Average monthly benefit of beneficiaries	$1,484	$1,181	$1,134	$843	$1,484	$1,576	$1,136
Number of beneficiaries	50	41	23	14	11	8	7
Valuation date: 6/30/2017							
Average monthly benefit of retirees	$1,986	$2,057	$1,942	$1,603	$1,468	$1,787	$1,670
Number of retirees	368	366	256	117	81	61	60
Average monthly benefit of beneficiaries	$1,461	$1,300	$1,236	$917	$1,381	$1,534	$1,280
Number of beneficiaries	46	39	28	13	12	7	8
Valuation date: 6/30/2018							
Average monthly benefit of retirees	$2,065	$2,115	$2,111	$1,560	$1,510	$1,866	$1,766
Number of retirees	333	392	284	127	81	62	58
Average monthly benefit of beneficiaries	$1,344	$1,445	$1,330	$875	$1,342	$1,708	$1,224
Number of beneficiaries	47	38	27	13	14	6	8
Valuation date: 6/30/2019							
Average monthly benefit of retirees	$2,096	$2,213	$2,172	$1,615	$1,697	$1,826	$1,825
Number of retirees	352	387	298	139	88	74	58
Average monthly benefit of beneficiaries	$1,293	$1,571	$1,381	$1,058	$1,186	$1,978	$1,478
Number of beneficiaries	50	37	29	12	14	6	8

EXHIBIT D – AVERAGE ANNUAL BENEFIT OF RETIRED MEMBERS AND BENEFICIARIES BY AGE, YEARS IN RETIREMENT AS OF JUNE 30, 2019 TOTAL PLAN

		Years in Retirement						
Age	Total	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 & over
Under 45	7	3	3	1	- -	- -	- -	- -
	$21,394	$21,552	$28,027	$1,017	- -	- -	- -	- -
45 - 49	13	6	3	3	1	- -	- -	- -
	26,593	23,787	32,274	25,393	$29,987	- -	- -	- -
50 - 54	51	47	2	1	- -	- -	1	- -
	19,097	18,894	20,397	24,449	- -	- -	$20,690	- -
55 - 59	144	70	55	11	3	3	2	- -
	21,758	25,043	18,107	17,014	26,403	$22,530	25,187	- -
60 - 64	245	88	86	58	7	2	2	2
	23,007	27,203	25,826	13,139	21,821	21,181	18,935	$13,316
65 - 69	381	125	120	84	35	9	5	3
	25,371	25,993	29,550	25,156	10,184	23,316	23,701	24,474
70 - 74	357	42	113	109	50	32	5	6
	25,611	18,878	27,370	32,218	18,307	16,802	26,513	26,665
75 - 79	163	9	30	42	27	25	19	11
	24,092	13,616	22,592	27,172	29,011	23,501	17,067	26,394
80 - 84	92	5	6	12	22	14	21	12
	21,206	19,421	19,894	27,260	20,686	19,724	21,111	19,399
85 & over	99	7	6	6	6	17	25	32
	19,567	17,902	16,487	17,143	12,384	15,917	25,439	19,663
Total	**1,552**	**402**	**424**	**327**	**151**	**102**	**80**	**66**
	$23,752	**$23,953**	**$25,881**	**$25,220**	**$18,850**	**$19,527**	**$22,045**	**$21,400**

EXHIBIT D – AVERAGE ANNUAL BENEFIT OF RETIRED MEMBERS AND BENEFICIARIES (CONTINUED)
BY AGE, YEARS IN RETIREMENT AS OF JUNE 30, 2019
GENERAL

	Years in Retirement							
Age	Total	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 & over
Under 45	3	2	- -	1	- -	- -	- -	- -
	$9,381	$13,563	- -	$1,017	- -	- -	- -	- -
45 - 49	3	2	1	- -	- -	- -	- -	- -
	21,284	20,483	22,887	- -	- -	- -	- -	- -
50 - 54	25	21	2	1	- -	- -	1	- -
	15,667	14,559	20,397	24,449	- -	- -	$20,690	- -
55 - 59	106	50	42	9	2	2	1	- -
	15,813	17,969	12,798	14,468	$25,063	$17,940	24,036	- -
60 - 64	211	77	71	52	6	1	2	2
	18,603	23,884	16,961	12,615	22,607	25,809	18,935	$13,316
65 - 69	340	117	113	68	33	5	3	1
	23,978	25,256	29,756	18,804	9,768	26,963	23,818	27,885
70 - 74	306	39	105	99	36	22	3	2
	24,043	16,804	27,892	29,837	12,930	11,194	24,660	16,698
75 - 79	134	9	29	37	23	17	16	3
	22,594	13,616	22,682	26,337	27,056	20,830	14,275	22,679
80 - 84	81	4	6	8	22	13	19	9
	18,099	17,740	19,894	12,713	20,686	18,378	19,997	11,110
85 & over	92	7	5	6	5	15	24	30
	19,100	17,902	17,708	17,143	11,091	14,168	24,660	19,354
Total	**1,301**	**328**	**374**	**281**	**127**	**75**	**69**	**47**
	$21,403	**$21,465**	**$23,963**	**$22,147**	**$16,586**	**$16,644**	**$20,699**	**$17,799**

EXHIBIT D – AVERAGE ANNUAL BENEFIT OF RETIRED MEMBERS AND BENEFICIARIES (CONTINUED)
BY AGE, YEARS IN RETIREMENT AS OF JUNE 30, 2019
SAFETY

	Years in Retirement							
Age	**Total**	**0 - 4**	**5 - 9**	**10 - 14**	**15 - 19**	**20 - 24**	**25 - 29**	**30 & over**
Under 45	4	1	3	- -	- -	- -	- -	- -
	$30,403	$37,532	$28,027	- -	- -	- -	- -	- -
45 - 49	8	4	2	2	- -	- -	- -	- -
	27,718	25,440	36,968	$23,024	- -	- -	- -	- -
50 - 54	23	23	- -	- -	- -	- -	- -	- -
	23,519	23,519	- -	- -	- -	- -	- -	- -
55 - 59	33	16	12	2	1	1	1	- -
	39,354	45,500	35,553	28,471	$29,083	$31,708	$26,338	- -
60 - 64	24	8	11	3	1	1	- -	- -
	55,685	54,958	73,155	19,467	17,106	16,553	- -	- -
65 - 69	25	5	2	9	1	4	2	2
	41,417	38,053	22,721	68,279	17,586	18,757	23,526	$22,768
70 - 74	39	1	4	7	11	10	2	4
	33,875	89,138	17,648	50,464	30,141	29,141	29,294	31,648
75 - 79	27	- -	- -	4	4	8	3	8
	31,563	- -	- -	34,900	40,251	29,178	31,955	27,787
80 - 84	11	1	- -	4	- -	1	2	3
	44,087	26,145	- -	56,353	- -	37,220	31,690	44,266
85 & over	7	- -	1	- -	1	2	1	2
	25,717	- -	10,383	- -	18,847	29,038	44,124	24,294
Total	**201**	**59**	**35**	**31**	**19**	**27**	**11**	**19**
	$36,782	**$36,499**	**$43,308**	**$48,199**	**$30,273**	**$27,534**	**$30,486**	**$30,306**

EXHIBIT D – AVERAGE ANNUAL BENEFIT OF RETIRED MEMBERS AND BENEFICIARIES (CONTINUED)
BY AGE, YEARS IN RETIREMENT AS OF JUNE 30, 2019
PROBATION

		Years in Retirement						
Age	Total	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 & over
Under 45	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -
45 - 49	2	- -	- -	1	1	- -	- -	- -
	$30,058	- -	- -	$30,130	$29,987	- -	- -	- -
50 - 54	3	3	- -	- -	- -	- -	- -	- -
	13,786	$13,786	- -	- -	- -	- -	- -	- -
55 - 59	5	4	1	- -	- -	- -	- -	- -
	31,662	31,647	31,719	- -	- -	- -	- -	- -
60 - 64	10	3	4	3	- -	- -	- -	- -
	37,492	38,383	53,024	15,893	- -	- -	- -	- -
65 - 69	16	3	5	7	1	- -	- -	- -
	29,899	34,638	27,614	31,414	16,511	- -	- -	- -
70 - 74	12	2	4	3	3	- -	- -	- -
	38,738	24,173	23,380	68,233	39,431	- -	- -	- -
75 - 79	2	- -	1	1	- -	- -	- -	- -
	23,565	- -	19,989	27,141	- -	- -	- -	- -
80 - 84	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -
85 & over	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -
Total	**50**	**15**	**15**	**15**	**5**	**0**	**0**	**0**
	$32,502	**$29,024**	**$33,026**	**$35,303**	**$32,958**	**$0**	**$0**	**$0**

EXHIBIT E – RECONCILIATION OF MEMBER DATA

	Active Members	Inactive Vested Members	Retired Members	Disabled Members	Beneficiaries	Total
Number as of June 30, 2018	**1,162**	**497**	**1,161**	**176**	**153**	**3,149**
• New members	160	0	0	0	13	173
• Terminations – with vested rights	-55	55	0	0	0	0
• Contribution refunds	-61	-25	0	0	0	-86
• Retirements	-60	-24	84	0	0	0
• New disabilities	-2	0	-2	4	0	0
• Return to work	9	-8	-1	0	0	0
• Died with or without beneficiary	-2	0	-26	-2	-10	-40
• Data adjustments	0	20*	2	0	0	22
Number as of June 30, 2019	**1,151**	**515**	**1,218**	**178**	**156**	**3,218**

(1) Includes 19 members who were hired and terminated employment after June 30, 2018.

EXHIBIT F – SUMMARY STATEMENT OF INCOME AND EXPENSES ON A MARKET VALUE BASIS

	Year Ended June 30, 2019		Year Ended June 30, 2018	
Net assets at market value at the beginning of the year		**$520,429,961**		**$484,026,717**
Contribution income:				
• Employer contributions	$23,702,064		$20,430,644	
• Member contributions	6,544,192		5,996,462	
Contribution income		$30,246,256		$26,427,106
Investment income:				
• Interest, dividends and other income	$7,764,206		$6,676,154	
• Asset appreciation	13,100,919		39,520,672	
• Less investment expenses	(906,006)		(924,841)	
Net investment income		$19,959,119		$45,271,985
Total income available for benefits		**$50,205,375**		**$71,699,091**
Less benefit payments:				
• Benefit payments and refunds	$(36,674,901)		$(34,153,672)	
• Administrative expenses	(1,233,416)		(1,142,175)	
Net benefit payments		$(37,908,317)		$(35,295,847)
Change in net assets at market value		**$12,297,058**		**$36,403,244**
Net assets at market value at the end of the year		**$532,727,019**		**$520,429,961**

Note: Results may be slightly off due to rounding.

EXHIBIT G – SUMMARY STATEMENT OF PLAN ASSETS

		Year Ended June 30, 2019		Year Ended June 30, 2018
Cash equivalents		$277,833		$1,990,220
Accounts receivable:				
• Member contributions	$231,239		$214,942	
• Employer contributions	861,411		747,689	
• Other	120,458		173,288	
Total accounts receivable		$1,213,108		$1,135,919
Investments:				
• Fixed income	$111,668,799		$103,773,892	
• Equities	360,478,736		358,124,373	
• Real estate and real estate partnerships	60,129,415		56,470,400	
Total investments at market value		$532,276,950		$518,368,665
Equipment		396,916		476,299
Total assets		$534,164,807		$521,971,103
Accounts payable:				
• Accounts payable	$(232,059)		$(286,177)	
• Accrued expenses and other liabilities	(1,205,731)		(1,254,965)	
Total accounts payable		$(1,437,790)		$(1,541,142)
Net assets at market value		**$532,727,019**		**$520,429,961**
Net assets at actuarial value		**$532,691,627**		**$510,023,422**
Net assets at valuation value		**$527,367,477**		**$504,803,711**

Note: Results may be slightly off due to rounding.

EXHIBIT H – DEVELOPMENT OF THE FUND THROUGH JUNE 30, 2019

Year Ended June 30	Employer Contributions	Member Contributions	Net Investment Return[1]	Benefit Payments	Market Value of Assets at Year-End	Actuarial Value of Assets at Year-End	Actuarial Value as a Percent of Market Value
2010	$8,234,253	$6,502,080	$37,487,635	$24,222,316	$300,042,562[2]	$346,205,958[3]	115.4%
2011	9,553,955	5,446,964	63,435,337	23,436,295	355,042,523	351,940,733	99.1%
2012	11,811,076	4,840,275	(4,776,952)	24,180,110	342,736,812	365,918,684	106.8%
2013	14,260,473	4,712,593	48,060,493	26,573,554	383,196,817	382,612,375	99.8%
2014	14,324,752	4,575,895	67,564,513	27,353,529	442,308,448	409,284,122	92.5%
2015	15,164,044	4,651,960	12,142,037	30,049,133	444,217,356	432,679,307	97.4%
2016	19,129,191	5,544,925	(11,494,818)	31,058,643	426,338,011	451,044,882	105.8%
2017	19,116,426	5,753,907	65,583,775	32,765,402	484,026,717	480,079,636	99.2%
2018	20,430,644	5,996,462	44,129,810	34,153,672	520,429,961	510,023,422	98.0%
2019	23,702,064	6,544,192	18,725,703	36,674,901	532,727,019	532,691,627	100.0%

[1] On a market basis, net of investment fees and administrative expenses.

[2] Updated to reflect final audited market value of assets, instead of the $299,741,053 preliminary market value used in the June 30, 2010 valuation.

[3] Reflects correction to typographical error in previous actuary's June 30, 2010 valuation report.

EXHIBIT I – TABLE OF AMORTIZATION BASES

Type	Date Established	Initial Amount	Initial Period	Outstanding Balance	Years Remaining	Annual Payment
General						
Combined base	June 30, 2012	$96,509,955	27	$102,521,358	20	$7,160,742
Experience loss	June 30, 2013	1,308,206	18	1,189,983	12	122,704
Experience gain	June 30, 2014	(10,922,004)	18	(10,181,141)	13	(984,179)
Change in assumptions/methods	June 30, 2014	41,158,191	18	38,366,343	13	3,708,754
Experience gain	June 30, 2015	(2,476,999)	18	(2,360,193)	14	(215,141)
Experience loss	June 30, 2016	1,249,423	18	1,210,812	15	104,600
Experience gain	June 30, 2017	(6,932,729)	18	(6,803,339)	16	(559,440)
Change in assumptions	June 30, 2017	21,071,591	18	20,678,316	16	1,700,383
Experience loss	June 30, 2018	5,742,836	18	5,698,602	17	447,750
Experience loss	June 30, 2019	8,521,818	18	8,521,818	18	641,950
Subtotal				**$158,842,559**		**$12,128,123**
Safety						
Combined base	June 30, 2012	$24,941,466	27	$26,495,017	20	$1,850,580
Experience loss	June 30, 2013	2,713,369	18	2,468,162	12	254,502
Experience gain	June 30, 2014	(489,900)	18	(456,669)	13	(44,145)
Change in assumptions/methods	June 30, 2014	13,983,439	18	13,034,912	13	1,260,044
Experience loss	June 30, 2015	4,163,162	18	3,966,844	14	361,594
Experience loss	June 30, 2016	1,209,820	18	1,172,433	15	101,285
Experience gain	June 30, 2017	(1,978,056)	18	(1,941,138)	16	(159,620)
Change in assumptions	June 30, 2017	5,932,121	18	5,821,405	16	478,696
Experience loss	June 30, 2018	3,402,016	18	3,375,812	17	265,244
Experience gain	June 30, 2019	(612,075)	18	(612,075)	18	(46,108)
Subtotal				**$53,324,703**		**$4,322,072**

EXHIBIT I – TABLE OF AMORTIZATION BASES (CONTINUED)

Type	Date Established	Initial Amount	Initial Period	Outstanding Balance	Years Remaining	Annual Payment
Probation						
Combined base	June 30, 2012	$5,075,598	27	$5,391,746	20	$376,594
Experience gain	June 30, 2013	(964,299)	18	(877,156)	12	(90,447)
Experience gain	June 30, 2014	(834,449)	18	(777,846)	13	(75,192)
Change in assumptions/methods	June 30, 2014	3,045,283	18	2,838,715	13	274,410
Experience gain	June 30, 2015	(194,174)	18	(185,019)	14	(16,865)
Experience gain	June 30, 2016	(39,275)	18	(38,060)	15	(3,288)
Experience gain	June 30, 2017	(535,517)	18	(525,522)	16	(43,214)
Change in assumptions	June 30, 2017	1,217,274	18	1,194,555	16	98,229
Experience gain	June 30, 2018	(50,151)	18	(49,765)	17	(3,910)
Experience loss	June 30, 2019	558,987	18	558,987	18	42,109
Subtotal				**$7,530,635**		**$558,426**
Total						
Combined base	June 30, 2012	$126,527,019	27	$134,408,121	20	$9,387,916
Experience loss	June 30, 2013	3,057,276	18	2,780,989	12	286,759
Experience gain	June 30, 2014	(12,246,353)	18	(11,415,656)	13	(1,103,516)
Change in assumptions/methods	June 30, 2014	58,186,913	18	54,239,970	13	5,243,208
Experience loss	June 30, 2015	1,491,989	18	1,421,632	14	129,588
Experience loss	June 30, 2016	2,419,968	18	2,345,185	15	202,597
Experience gain	June 30, 2017	(9,446,302)	18	(9,269,999)	16	(762,274)
Change in assumptions	June 30, 2017	28,220,986	18	27,694,276	16	2,277,308
Experience loss	June 30, 2018	9,094,701	18	9,024,649	17	709,084
Experience loss	June 30, 2019	8,468,730	18	8,468,730	18	637,951
Total				**$219,697,897**		**$17,008,621**

EXHIBIT J – PROJECTION OF UAAL BALANCES AND PAYMENTS

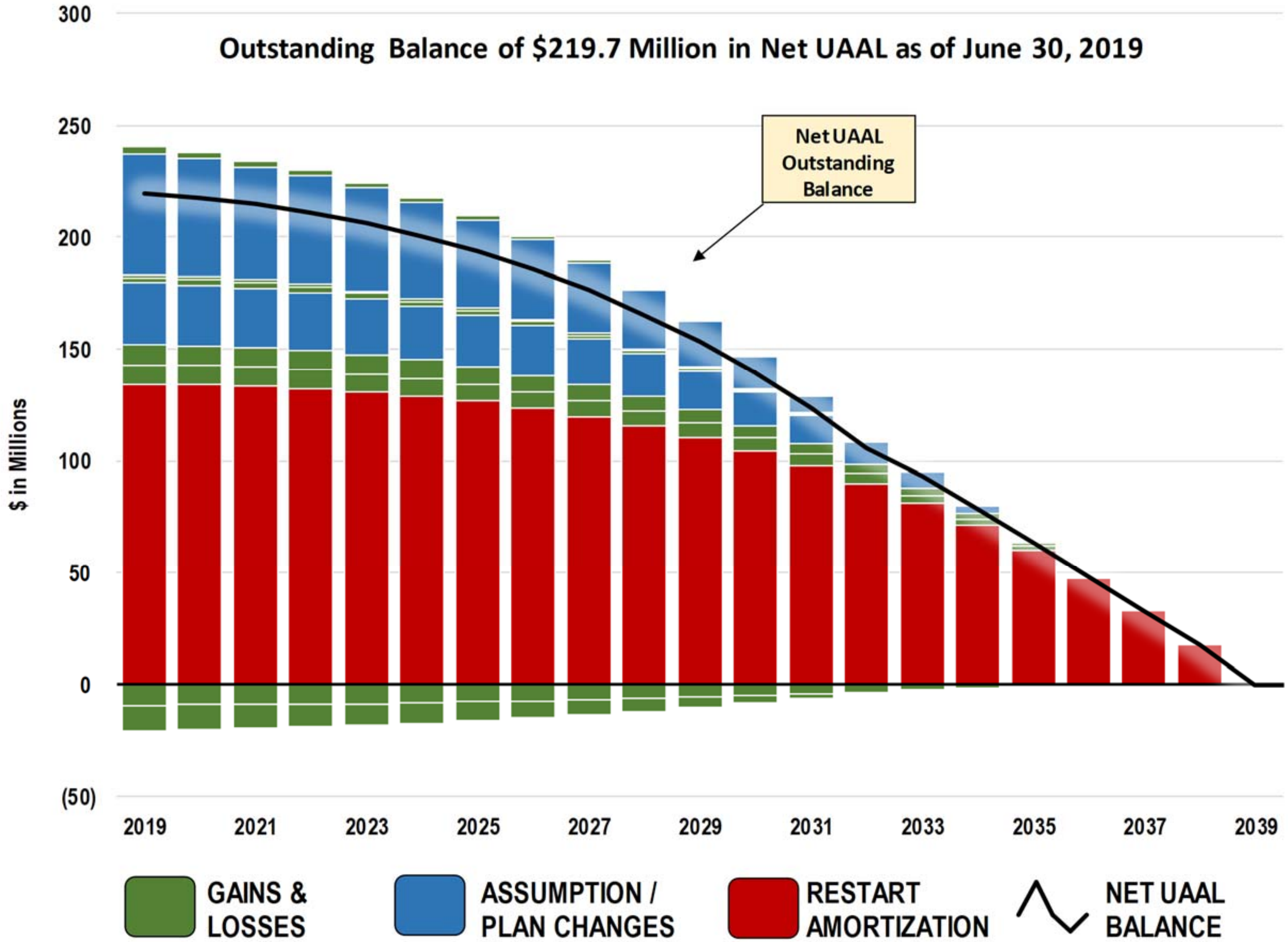

EXHIBIT J – PROJECTION OF UAAL BALANCES AND PAYMENTS (CONTINUED)

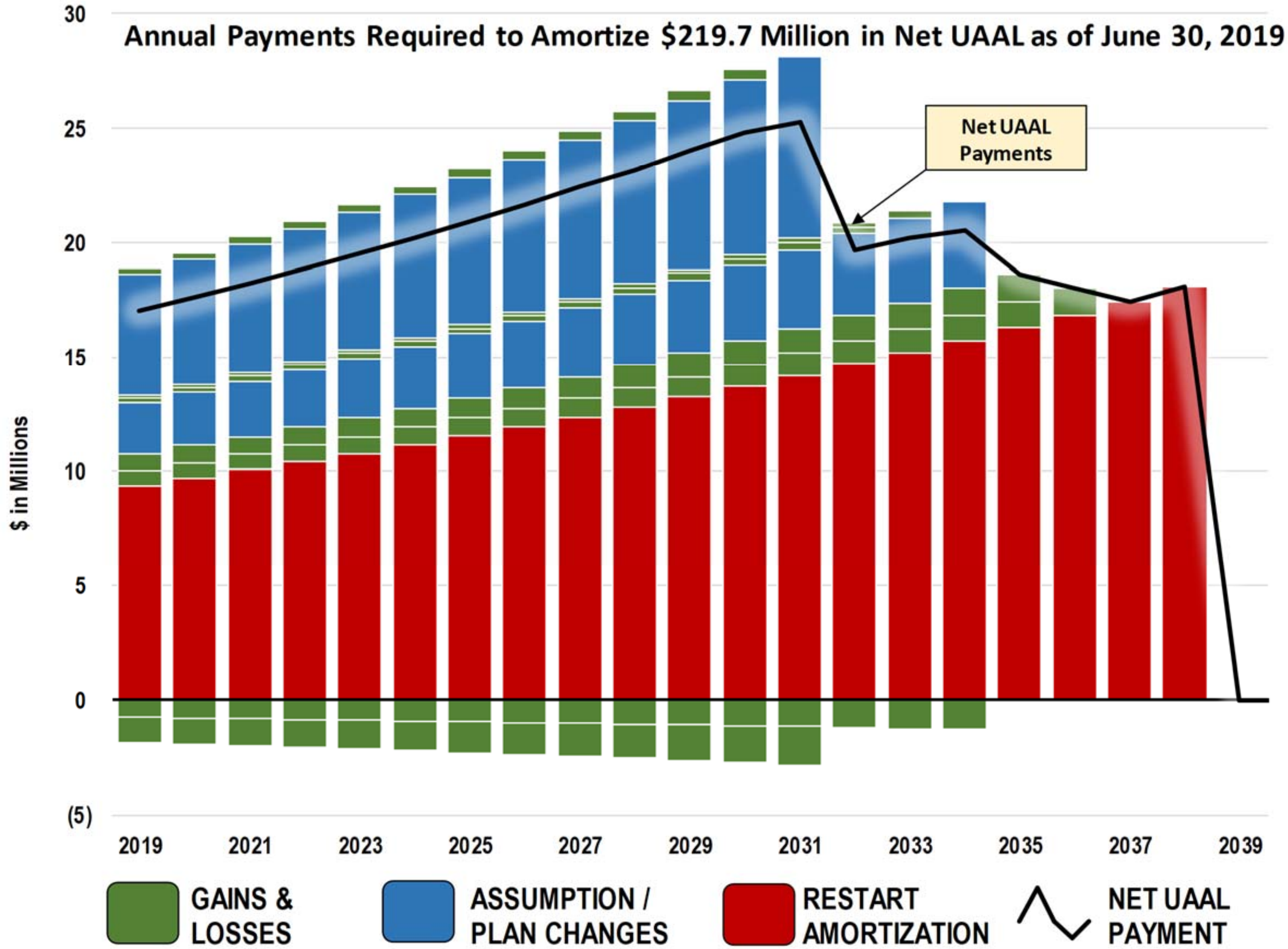

EXHIBIT K – DEFINITION OF PENSION TERMS

The following list defines certain technical terms for the convenience of the reader:

Actuarial Accrued Liability for Actives:	The equivalent of the accumulated Normal Costs allocated to the years before the valuation date.
Actuarial Accrued Liability for Pensioners and Beneficiaries:	Actuarial Present Value of lifetime benefits to existing pensioners and beneficiaries. This sum takes account of life expectancies appropriate to the ages of the annuitants and the interest that the sum is expected to earn before it is entirely paid out in benefits.
Actuarial Cost Method:	A procedure allocating the Actuarial Present Value of Future Benefits to various time periods; a method used to determine the Normal Cost and the Actuarial Accrued Liability that are used to determine the recommended contribution.
Actuarial Gain or Loss:	A measure of the difference between actual experience and that expected based upon a set of Actuarial Assumptions, during the period between two Actuarial Valuation dates. To the extent that actual experience differs from that assumed, Actuarial Accrued Liabilities emerge which may be the same as forecasted, or may be larger or smaller than projected. Actuarial gains are due to favorable experience, e.g., assets earn more than projected, salary increases are less than assumed, members retire later than assumed, etc. Favorable experience means actual results produce actuarial liabilities not as large as projected by the actuarial assumptions. On the other hand, actuarial losses are the result of unfavorable experience, i.e., actual results yield actuarial liabilities that are larger than projected.
Actuarially Equivalent:	Of equal Actuarial Present Value, determined as of a given date and based on a given set of Actuarial Assumptions.
Actuarial Present Value (APV):	The value of an amount or series of amounts payable or receivable at various times, determined as of a given date by the application of a particular set of Actuarial Assumptions. Each such amount or series of amounts is: Adjusted for the probable financial effect of certain intervening events (such as changes in compensation levels, marital status, etc.) Multiplied by the probability of the occurrence of an event (such as survival, death, disability, withdrawal, etc.) on which the payment is conditioned, and Discounted according to an assumed rate (or rates) of return to reflect the time value of money.

Actuarial Present Value of Future Benefits:	The Actuarial Present Value of benefit amounts expected to be paid at various future times under a particular set of Actuarial Assumptions, taking into account such items as the effect of advancement in age, anticipated future compensation, and future service credits. The Actuarial Present Value of Future Benefits includes the liabilities for active members, retired members, beneficiaries receiving benefits, and inactive members entitled to either a refund of member contributions or a future retirement benefit. Expressed another way, it is the value that would have to be invested on the valuation date so that the amount invested plus investment earnings would provide sufficient assets to pay all projected benefits and expenses when due.
Actuarial Valuation:	The determination, as of a valuation date, of the Normal Cost, Actuarial Accrued Liability, Actuarial Value of Assets, and related Actuarial Present Values for a plan, as well as Actuarially Determined Contributions.
Actuarial Value of Assets (AVA):	The value of the Plan's assets as of a given date, used by the actuary for valuation purposes. This may be the market or fair value of plan assets, but commonly plans use a smoothed value in order to reduce the year-to-year volatility of calculated results, such as the funded ratio and the Actuarially Determined Contribution.
Actuarially Determined:	Values that have been determined utilizing the principles of actuarial science. An actuarially determined value is derived by application of the appropriate actuarial assumptions to specified values determined by provisions of the Plan.
Actuarially Determined Contribution (ADC):	The employer's periodic required contributions, expressed as a dollar amount or a percentage of covered plan compensation, determined under the Plan's funding policy. The ADC consists of the employer Normal Cost and the Amortization Payment.
Amortization Method:	A method for determining the Amortization Payment. The most common methods used are level dollar and level percentage of payroll. Under the Level Dollar method, the Amortization Payment is one of a stream of payments, all equal, whose Actuarial Present Value is equal to the Unfunded Actuarial Accrued Liability. Under the Level Percentage of Pay method, the Amortization Payment is one of a stream of increasing payments, whose Actuarial Present Value is equal to the Unfunded Actuarial Accrued Liability. Under the Level Percentage of Pay method, the stream of payments increases at the assumed rate at which total covered payroll of all active members will increase.
Amortization Payment:	The portion of the pension plan contribution, or ADC, that is intended to payoff the Unfunded Actuarial Accrued Liability.

Assumptions or Actuarial Assumptions:	The estimates upon which the cost of the Plan is calculated, including: Investment return - the rate of investment yield that the Plan will earn over the long-term future; Mortality rates - the rate or probability of death at a given age for employees and pensioners; Retirement rates - the rate or probability of retirement at a given age or service; Disability rates – the rate or probability of disability retirement at a given age; Withdrawal rates - the rate or probability at which employees of various ages are expected to leave employment for reasons other than death, disability, or retirement; Salary increase rates - the rates of salary increase due to inflation, real wage growth and merit and promotion increases.
Closed Amortization Period:	A specific number of years that is counted down by one each year, and therefore declines to zero with the passage of time. For example, if the amortization period is initially set at 20 years, it is 19 years at the end of one year, 18 years at the end of two years, etc. See Open Amortization Period.
Decrements:	Those causes/events due to which a member's status (active-inactive-retiree-beneficiary) changes, that is: death, retirement, disability, or withdrawal.
Defined Benefit Plan:	A retirement plan in which benefits are defined by a formula based on the member's compensation, age and/or years of service.
Defined Contribution Plan:	A retirement plan, such as a 401(k) plan, a 403(b) plan, or a 457 plan, in which the contributions to the plan are assigned to an account for each member, the plan's earnings are allocated to each account, and each member's benefits are a direct function of the account balance.
Experience Study:	A periodic review and analysis of the actual experience of the Plan that may lead to a revision of one or more actuarial assumptions. Actual rates of decrement and salary increases are compared to the actuarially assumed values and modified based on recommendations from the Actuary.
Funded Ratio:	The ratio of the Valuation Value of Assets (VVA) to the Actuarial Accrued Liability (AAL). Plans sometimes also calculate a market funded ratio, using the Market Value of Assets (MVA), rather than the VVA.
Investment Return:	The rate of earnings of the Plan from its investments, including interest, dividends and capital gain and loss adjustments, computed as a percentage of the average value of the fund. For actuarial purposes, the investment return often reflects a smoothing of the capital gains and losses to avoid significant swings in the value of assets from one year to the next.
Normal Cost:	The portion of the Actuarial Present Value of Future Benefits allocated to a valuation year by the Actuarial Cost Method. Any payment with respect to an Unfunded Actuarial Accrued Liability is not part of the Normal Cost (see Amortization Payment). For pension plan benefits that are provided in part by employee contributions, Normal Cost refers to the total of member contributions and employer Normal Cost unless otherwise specifically stated.

Open Amortization Period:	An open amortization period is one which is used to determine the Amortization Payment but which does not change over time. If the initial period is set as 30 years, the same 30-year period is used in each future year in determining the Amortization Period.
Unfunded Actuarial Accrued Liability:	The excess of the Actuarial Accrued Liability over the Valuation Value of Assets. This value may be negative, in which case it may be expressed as a negative Unfunded Actuarial Accrued Liability, also called the Funding Surplus or an Overfunded Actuarial Accrued Liability.
Valuation Date or Actuarial Valuation Date:	The date as of which the value of assets is determined and as of which the Actuarial Present Value of Future Benefits is determined. The expected benefits to be paid in the future are discounted to this date.
Valuation Value of Assets:	The Actuarial Value of Assets reduced by the value of non-valuation reserves.

Section 4: Actuarial Valuation Basis

EXHIBIT I – ACTUARIAL ASSUMPTIONS AND METHODS

Rationale for Assumptions	The information and analysis used in selecting each assumption that has a significant effect on this actuarial valuation is shown in the July 1, 2013 through June 30, 2016 Actuarial Experience Study report dated April 14, 2017. Unless otherwise noted, all actuarial assumptions and methods shown below apply to all membership groups (i.e., General, Safety, and Probation) and tiers. These assumptions were adopted by the Board.
<u>Economic Assumptions</u>	
Net Investment Return:	7.00%; net of administrative and investment expenses. Based on the Actuarial Experience Study referenced above, expected administrative and investment expenses represent about 0.40% of the Market Value of Assets.
Employee Contribution Crediting Rate:	7.00%, compounded semi-annually.
Consumer Price Index:	Increase of 3.00% per year. Retiree COLA increases due to CPI are subject to a 3% maximum change per year for General Tiers 1, 2, and 3, Safety Tiers 1 and 2, and Probation Tiers 1 and 2 (no COLA increases for General Tier 4, Safety Tier 3, and Probation Tier 3).
Payroll Growth:	Inflation of 3.00% per year plus real "across the board" salary increases of 0.50% per year, used to amortize the Unfunded Actuarial Accrued Liability as a level percentage of payroll.
Increase in Internal Revenue Code Section 401(a)(17) Compensation Limit:	Increase of 3.00% per year from the valuation date.
Increase in Section 7522.10 Compensation Limit:	Increase of 3.00% per year from the valuation date.

Salary Increases:

The annual rate of compensation increase includes: inflation at 3.00%, plus “across the board” salary increases of 0.50% per year, plus the following merit and promotion increases:

Merit and Promotion Increases		
Years of Service	Rate (%)	
	General	Safety and Probation
Less than 1	5.00%	5.00%
1 – 2	3.75	3.75
2 – 3	3.50	3.00
3 – 4	2.75	2.25
4 – 5	2.25	1.00
5 – 6	1.75	0.75
6 – 7	1.50	0.75
7 – 8	1.25	0.75
8 – 9	1.00	0.75
9 – 10	0.75	0.75
10 & Over	0.50	0.50

Demographic Assumptions

Post-Retirement Mortality Rates:

Healthy

- **All Members and All Beneficiaries:** Headcount-Weighted RP-2014 (RPH-2014) Healthy Annuitant Mortality Tables, set back one year for males and set forward one year females, projected 20 years with the two-dimensional mortality improvement Scale MP-2016.

Disabled

- **All Members:** Headcount-Weighted RP-2014 (RPH-2014) Healthy Annuitant Mortality Tables, set forward four years for males and set forward six years for females, projected 20 years with the two-dimensional mortality improvement Scale MP-2016.

The above mortality tables contain a margin of about 20%, based on actual to expected deaths, as a provision to reflect future mortality improvement, based on a review of mortality experience as of the measurement date.

Pre-Retirement Mortality Rates:	• **General and Safety Members:** Headcount-Weighted RP-2014 (RPH-2014) Employee Mortality Tables, set back one year for males and set forward one year for females, projected 20 years with the two-dimensional mortality improvement Scale MP-2016.

	Rate (%)			
	General		Safety and Probation	
Age	Male	Female	Male	Female
25	0.05	0.02	0.05	0.02
30	0.05	0.02	0.05	0.02
35	0.05	0.03	0.05	0.03
40	0.07	0.05	0.07	0.05
45	0.09	0.08	0.09	0.08
50	0.15	0.13	0.15	0.13
55	0.25	0.19	0.25	0.19
60	0.42	0.28	0.42	0.28
65	0.75	0.42	0.75	0.42

All General pre-retirement deaths are assumed to be non-service connected deaths. All Safety and Probation pre-retirement deaths are assumed to be service connected deaths.

Mortality Rates for Member Contributions:	• **General Members:** Headcount-Weighted RP-2014 (RPH-2014) Healthy Annuitant Mortality Tables, set back one year for males and set forward one year for females, projected 20 years with the two-dimensional mortality improvement Scale MP-2016, weighted 30% male and 70% female. • **Safety and Probation Members:** Headcount-Weighted RP-2014 (RPH-2014) Healthy Annuitant Mortality Tables, set back one year for males and set forward one year for females, projected 20 years with the two-dimensional mortality improvement Scale MP-2016, weighted 80% male and 20% female.

Disability Incidence:

Disability Incidence			
	Rate (%)		
Age	General	Safety	Probation
20	0.01%	0.10%	0.10%
25	0.01	0.13	0.13
30	0.01	0.18	0.18
35	0.02	0.98	0.98
40	0.13	1.65	1.65
45	0.35	1.75	1.75
50	0.51	2.35	2.35
55	0.58	2.75	2.75
60	0.60	0.00	0.00
65	0.63	0.00	0.00

35% of General disabilities are assumed to be service connected disabilities. The other 65% are assumed to be non-service connected disabilities.

95% of Safety and Probation disabilities are assumed to be service connected disabilities. The other 5% are assumed to be non-service connected disabilities.

Termination:

Termination (< 5 Years of Service)			
Years of Service	Rate (%)		
	General	Safety	Probation
Less than 1	22.00%	16.00%	16.00%
1 – 2	16.00	13.00	13.00
2 – 3	14.00	10.00	10.00
3 – 4	13.00	9.00	9.00
4 – 5	12.00	8.00	8.00

85% of all terminated members with less than 5 years of service are assumed to choose a refund of contributions. The other 15% are assumed to choose a deferred vested benefit. No termination is assumed after a member is eligible for retirement (as long as a retirement rate is present).

Termination (5+ Years of Service)			
Age	Rate (%)		
	General	Safety	Probation
20	7.50%	7.40%	7.40%
25	7.50	6.40	6.40
30	7.50	5.40	5.40
35	7.50	4.40	4.40
40	7.50	3.40	3.40
45	7.50	2.70	2.70
50	7.50	2.20	2.20
55	6.90	0.80	0.80
60	5.90	0.00	0.00
65	4.90	0.00	0.00

25% of all terminated members with 5 or more years of service are assumed to choose a refund of contributions. The other 75% are assumed to choose a deferred vested benefit. No termination is assumed after a member is eligible for retirement (as long as a retirement rate is present).

Retirement Rates:

Age	Retirement Rates (%) General Tiers 1, 2, & 3	General Tier 4	Safety Tiers 1 & 2	Safety Tier 3	Probation Tiers 1 & 2	Probation Tier 3
50	6.00%	0.00%	8.00%	3.00%	5.00%	4.00%
51	6.00	0.00	8.00	3.00	5.00	4.00
52	6.00	6.00	8.00	3.00	5.00	4.00
53	6.00	3.00	8.00	3.00	5.00	4.00
54	6.00	3.00	8.00	3.00	5.00	4.00
55	11.00	5.00	9.00	4.00	20.00	11.00
56	11.00	5.00	9.00	6.00	20.00	21.00
57	11.00	5.00	10.00	7.00	20.00	21.00
58	11.00	5.00	20.00	9.00	20.00	21.00
59	11.00	5.00	30.00	30.00	20.00	21.00
60	12.00	6.00	100.00	100.00	100.00	100.00
61	16.00	9.00	100.00	100.00	100.00	100.00
62	30.00	12.00	100.00	100.00	100.00	100.00
63	20.00	14.00	100.00	100.00	100.00	100.00
64	20.00	12.00	100.00	100.00	100.00	100.00
65	45.00	32.00	100.00	100.00	100.00	100.00
66	45.00	32.00	100.00	100.00	100.00	100.00
67	45.00	32.00	100.00	100.00	100.00	100.00
68	45.00	32.00	100.00	100.00	100.00	100.00
69	45.00	32.00	100.00	100.00	100.00	100.00
70 & Over	100.00	100.00	100.00	100.00	100.00	100.00

The retirement rates only apply to members that are eligible to retire at the age shown.

Retirement Age and Benefit for Deferred Vested Members:

General Retirement Age: 60

Safety Retirement Age: 55

Deferred vested members who terminate with less than five years of service and are not vested are assumed to retire at age 70 if they decide to leave their contributions on deposit.

60% of future deferred vested members are assumed to continue to work for a reciprocal employer. For reciprocals, 4.00% compensation increases are assumed per annum.

Future Benefit Accruals:

1.0 year of service per year of employment, plus 0.018 years of additional service to anticipate conversion of unused sick leave for each year of employment, for members expected to retire directly from active employment and to receive a service retirement benefit.

Unknown Data for Members:

Same as those exhibited by members with similar known characteristics. If not specified, members are assumed to be male.

Inclusion of Deferred Vested Members:	All deferred vested members are included in the valuation.
Form of Payment:	All active and inactive members are assumed to elect the unmodified option at retirement.
Percent Married:	For all active and inactive members, 75% of male members and 50% of female members are assumed to be married at pre-retirement death or retirement.
Age and Gender of Spouse:	For all active and inactive members, male members are assumed to have a female spouse who is 2 years younger than the member and female members are assumed to have a male spouse who is 2 years older than the member.
<u>Actuarial Funding Policy</u>	
Actuarial Cost Method:	Entry Age Cost Method. Entry Age is the age on the valuation date minus years of service. Normal Cost and Actuarial Accrued Liability are calculated on an individual basis and are based on costs allocated as a level percentage of compensation, as if the current benefit formula for each individual has always been in effect (i.e., “replacement life within a tier”).
Actuarial Value of Assets:	Market value of assets (MVA) less unrecognized returns in each of the last five years. Unrecognized return is equal to the difference between the actual market return and the expected return on the market value, and is recognized over a five-year period. The actuarial value of assets (AVA) is limited by a 25% corridor; the AVA cannot be less than 75% of MVA, nor greater than 125% of MVA.
Valuation Value of Assets:	The Actuarial Value of Assets reduced by the value of the non-valuation reserves.
Amortization Policy:	Prior to July 1, 2012, the total UAAL was amortized on a 30-year decreasing period, with 27 years remaining as of June 30, 2012 (and 20 years remaining as of June, 2019). On or after July 1, 2012, any new UAAL resulting from plan amendments are amortized over separate decreasing 15-year periods; early retirement incentive programs (ERIPs) are amortized over separate decreasing 5-year periods; assumption and method changes are amortized over separate decreasing 18-year periods; and experience gains/losses are also amortized over separate decreasing 18-year periods.

Other Actuarial Methods	
Employer Contributions:	Employer contributions consist of two components: *Normal Cost* The annual contribution rate that, if paid annually from a member's first year of membership through the year of retirement, would accumulate to the amount necessary to fully fund the member's retirement-related benefits. Accumulation includes annual crediting of interest at the assumed investment earnings rate. The contribution rate is expressed as a level percentage of the member's compensation. *Contribution to the Unfunded Actuarial Accrued Liability (UAAL)* The annual contribution rate that, if paid annually over the UAAL amortization period, would accumulate to the amount necessary to fully fund the UAAL. Accumulation includes annual crediting of interest at the assumed investment earnings rate. The contribution (or rate credit in the case of a negative UAAL) is calculated to remain as a level percentage of future active member payroll (including payroll for new members as they enter the Association) assuming a constant number of active members. In order to remain as a level percentage of payroll, amortization payments (credits) are scheduled to increase at the annual rate of 3.50% (i.e., 3.00% inflation plus 0.50% across-the-board salary increase). The amortization policy is described on the previous page. Also, under the Board's funding policy adopted on April 17, 2013, in addition to the UAAL contribution rate, an amortization amount equal to the UAAL contribution rate times the covered payroll (as estimated in the actuarial valuation that establishes such UAAL contribution rate) will be calculated for each employer. The final UAAL payment by each employer will be equal to the UAAL contribution rate times the actual covered payroll or the above amortization amount, if greater. This means that UAAL contribution amounts will be equal to the greater of the UAAL contribution rates developed in *Section 2, Subsection F* of this valuation times the actual fiscal year 2020/2021 payroll, or the estimated UAAL annual contribution amounts also provided in *Section 2, Subsection F* of this valuation. To facilitate the calculation of the minimum UAAL dollar contribution amount, we have provided in *Section 2, Subsection F* a breakdown of the estimated UAAL annual contribution amounts by employer (i.e., County of Mendocino, Mendocino County Superior Court, and Russian River Cemetery District). On June 19, 2013 the Board adopted an additional change to the actuarial funding policy to anticipate the contribution rate impact that would result from the lag between the date of the actuarial valuation and the date of the contribution rate implementation. In general, the contribution rates determined in an actuarial valuation will apply to the fiscal year beginning 12 months after the valuation date. In compliance with the change in the funding policy, the employer contribution rates developed in this valuation have been adjusted to anticipate the delay in implementing the change in the employer contribution rates determined as of June 30, 2019 for the fiscal year 2020/2021. This adjustment is reflected in the UAAL portion of the June 30, 2019 employer rates. The recommended employer contributions are provided in *Section 2, Subsection F.* The minimum amounts required from each employer to amortize their UAAL are also provided in *Section 2, Subsection F.*

Member Contributions:	*General Tiers 1, 2, and 3, Safety Tiers 1 and 2, and Probation Tiers 1 and 2* Articles 6 and 6.8 of the 1937 Act define the methodology to be used in the calculation of member basic contribution rates for General Tier 1-3 members and for Safety and Probation Tier 1-2 members, respectively. The basic contribution rate is determined so that the accumulation of a member's basic contributions made in a given year until a certain age will be sufficient to fund an annuity at that age that is equal to 1/100 of Final Average Salary. That age is 60 for General members and 50 for Safety and Probation members. It is assumed that contributions are made annually at the same rate, starting at entry age. In addition to the basic contributions, members pay one-half of the total normal cost necessary to fund cost-of-living benefits. Following practices established by the Association's previous actuary prior to the June 30, 2011 valuation, we have also included a 1.63% of pay offset to the Safety member rates, which is picked up by the County. **No** other subsidies have been reflected in the member contribution rates. *General Tier 4, Safety Tier 3, and Probation Tier 3* Pursuant to Section 7522.30(a) of the Government Code, General Tier 4, Safety Tier 3, and Probation Tier 3 members are required to contribute at least 50% of the Normal Cost rate. In addition, there are certain additional requirements that would have to be met such as requiring the new employees to pay the contribution rate of "similarly situated employees", if it is greater. (reference: Section 7522.30(c)). We further understand that different rules may have to be applied for collectively bargained employees, non-represented, managerial or other supervisory employees (reference: Section 7522.30(e)). In preparing the Normal Cost rates in this report, we have assumed that exactly 50% of the Normal Cost would be paid by the new members and we have taken into account in this valuation only the requirements of Section 7522.30(c), but not the requirements of Section 7522.30(e). Accumulation for all members includes semi-annual crediting of interest at the assumed investment earnings rate. The member contribution rates for all members are provided in *Section 4, Exhibit III*.

Internal Revenue Code Section 415:	Section 415 of the Internal Revenue Code (IRC) specifies the maximum benefits that may be paid to an individual from a defined benefit plan and the maximum amounts that may be allocated each year to an individual's account in a defined contribution plan. A qualified pension plan may not pay benefits in excess of the Section 415 limits. The ultimate penalty for non-compliance is disqualification: active participants could be taxed on their vested benefits and the IRS may seek to tax the income earned on the plan's assets. In particular, Section 415(b) of the IRC limits the maximum annual benefit payable at the Normal Retirement Age to a dollar limit of $160,000 indexed for inflation. That limit is $225,000 for 2019. Normal Retirement Age for these purposes is age 62. These are the limits in simplified terms. They must be adjusted based on each participant's circumstances, for such things as age at retirement, form of benefits chosen and after tax contributions. Benefits for members in non-CalPEPRA tiers in excess of the limits may be paid through a qualified governmental excess plan that meets the requirements of Section 415(m). Legal Counsel's review and interpretation of the law and regulations should be sought on any questions in this regard. Contribution rates determined in this valuation have not been reduced for the Section 415 limitations. Actual limitations will result in gains as they occur.
Justification for Change in Actuarial Assumptions:	There have been no changes in actuarial assumptions since the last valuation.

EXHIBIT II – SUMMARY OF PLAN PROVISIONS

This exhibit summarizes the major provisions of the Plan included in the valuation. It is not intended to be, nor should it be interpreted as, a complete statement of all plan provisions.

Plan Year:	July 1 through June 30
Membership Eligibility:	Membership with MCERA usually begins with the first day of the pay period following the date of entrance into service.
General Tier 1	All General members appointed to a permanent position of four-fifths time, or more, in service of the County of Mendocino or in the service of a participating District, who were hired prior to July 1, 1984.
General Tier 2	General Tier 2 has been replaced by General Tier 3.
General Tier 3	All General members appointed to a permanent position of four-fifths time, or more, in service of the County of Mendocino or in the service of a participating District, who were hired on or after July 1, 1984 and prior to January 1, 2013.
General Tier 4	All General members appointed to a permanent position of four-fifths time, or more, in service of the County of Mendocino or in the service of a participating District, who were hired on or after January 1, 2013.
Safety Tier 1	All employees appointed to a position in active law enforcement who were hired prior to June 1, 1982.
Safety Tier 2	All employees appointed to a position in active law enforcement who were hired on or after June 1, 1982 and prior to January 1, 2013.
Safety Tier 3	All employees appointed to a position in active law enforcement who were hired on or after January 1, 2013.
Probation Tier 1	All employees appointed to positions with specific job classifications within the Departments of Probation, Juvenile Hall, and Social Services who were hired prior to July 1, 1984.
Probation Tier 2	All employees appointed to positions with specific job classifications within the Departments of Probation, Juvenile Hall, and Social Services who were hired on or after July 1, 1984 and prior to January 1, 2013.
Probation Tier 3	All employees appointed to positions with specific job classifications within the Departments of Probation, Juvenile Hall, and Social Services who were hired on or after January 1, 2013.
Final Compensation for Benefit Determination:	
General Tier 1, Safety Tier 1, and Probation Tier 1	Highest consecutive twelve months of compensation earnable (§31462.1) (FAS1).
General Tiers 2 and 3, Safety Tier 2, and Probation Tier 2	Highest consecutive thirty-six months of compensation earnable (§31462) (FAS3).

Final Compensation for Benefit Determination: (continued)	
General Tier 4, Safety Tier 3, and Probation Tier 3	Highest consecutive thirty-six months of pensionable compensation (§7522.10(c), §7522.32, §7522.34) (FAS3).
Compensation Limit:	
General Tiers 1, 2, and 3, Safety Tiers 1 and 2, and Probation Tiers 1 and 2	For members with membership dates on or after July 1, 1996, compensation earnable is limited by Internal Revenue Code Section 401(a)(17). The limit for 2019 is $280,000. The limit is indexed for inflation on an annual basis.
General Tier 4, Safety Tier 3, and Probation Tier 3	Pensionable compensation is limited to $124,180 for 2019 for an employer that is enrolled in Social Security. For an employer that is not enrolled in Social Security, the maximum amount for 2019 is 120% of $124,180, or $149,016. (reference: Section 7522.10) These amounts should be adjusted for changes to the Consumer Price Index for All Urban Consumers after 2019. (reference: Section 7522.10(d))
Service:	Years of service (Yrs) is based on the number of pay periods in which contributions are received (1 year of service equals 26 biweekly pay periods).
Service Retirement Eligibility:	
General Tiers 1, 2, and 3	Age 50 with 5 years of service and 10 years of membership, or age 70 and vested, or after 30 years of service regardless of age (§31672).
General Tier 4	Age 52 with 5 years of service, or age 70 (§7522.20(a)).
Safety and Probation Tiers 1 and 2	Age 50 with 5 years of service and 10 years of membership, or age 70 and vested, or after 20 years of service regardless of age (§31663.25).
Safety and Probation Tier 3	Age 50 with 5 years of service, or age 70 (§7522.25(d)).
Benefit Formula:	
*General Tier 1 (§31676.12)**	

Retirement Age	Benefit Formula
50	(1.34% x FAS1 – 1/3 x 1.34% x $350 x 12) x Yrs
55	(1.77% x FAS1 – 1/3 x 1.77% x $350 x 12) x Yrs
60	(2.34% x FAS1 – 1/3 x 2.34% x $350 x 12) x Yrs
62 and over	(2.62% x FAS1 – 1/3 x 2.62% x $350 x 12) x Yrs

Benefit Formula: (continued)

	Retirement Age	Benefit Formula
*General Tier 2 and General Tier 3 (§31676.12)**	50	(1.34% x FAS3 – 1/3 x 1.34% x $350 x 12) x Yrs
	55	(1.77% x FAS3 – 1/3 x 1.77% x $350 x 12) x Yrs
	60	(2.34% x FAS3 – 1/3 x 2.34% x $350 x 12) x Yrs
	62 and over	(2.62% x FAS3 – 1/3 x 2.62% x $350 x 12) x Yrs
General Tier 4 (§7522.20(a))	**Retirement Age**	**Benefit Formula**
	52	1.00% x FAS3 x Yrs
	55	1.30% x FAS3 x Yrs
	60	1.80% x FAS3 x Yrs
	62	2.00% x FAS3 x Yrs
	65	2.30% x FAS3 x Yrs
	67 and over	2.50% x FAS3 x Yrs

* *For members in Bargaining Groups 01 and 101 who have service prior to October 1, 2003 and who have not purchased this service to be covered under Section 31676.12, their prior service will be covered under Section 31676.11 for Tier 1 and Tier 2 and Section 31676.1 for Tier 3. For all other Bargaining Groups, the prior service date is January 1, 2002 (instead of October 1, 2003).*

	Retirement Age	Benefit Formula
Safety Tier 1 (§31664.2)	50	(2.29% x FAS1 – 1/3 x 2.29% x $350 x 12) x Yrs
	55 and over	(3.00% x FAS1 – 1/3 x 3.00% x $350 x 12) x Yrs
Safety Tier 2 (§31664.2)	**Retirement Age**	**Benefit Formula**
	50	(2.29% x FAS3 – 1/3 x 2.29% x $350 x 12) x Yrs
	55 and over	(3.00% x FAS3 – 1/3 x 3.00% x $350 x 12) x Yrs
Safety Tier 3 (§7522.25(d))	**Retirement Age**	**Benefit Formula**
	50	2.00% x FAS3 x Yrs
	55	2.50% x FAS3 x Yrs
	57 and over	2.70% x FAS3 x Yrs

Benefit Formula: (continued)		
Probation Tier 1 (§31664)	**Retirement Age**	**Benefit Formula**
	50	(2.00% x FAS1 – 1/3 x 2.00% x $350 x 12) x Yrs
	55 and over	(2.62% x FAS1 – 1/3 x 2.62% x $350 x 12) x Yrs
Probation Tier 2 (§31664)	**Retirement Age**	**Benefit Formula**
	50	(2.00% x FAS3 – 1/3 x 2.00% x $350 x 12) x Yrs
	55 and over	(2.62% x FAS3 – 1/3 x 2.62% x $350 x 12) x Yrs
Probation Tier 3 (§7522.25(d))	**Retirement Age**	**Benefit Formula**
	50	2.00% x FAS3 x Yrs
	55	2.50% x FAS3 x Yrs
	57 and over	2.70% x FAS3 x Yrs
Maximum Benefit:		
General Tiers 1, 2, and 3, Safety Tiers 1 and 2, and Probation Tiers 1 and 2	100% of Highest Average Compensation (§31676.12, §31664.2, and §31664).	
General Tier 4, Safety Tier 3, and Probation Tier 3	None (§7522.20(a) and §7522.25(d)).	
Non-Service Connected Disability:		
All Members		
Eligibility	Five years of service (§31720).	
Benefit Formula	1.8% of Final Compensation per year of service. If the benefit does not exceed one-third of Final Compensation, the service is projected to 62 for General members and to age 55 for Safety and Probation members, but the total benefit cannot be more than one-third of Final Compensation (§31727.1 and §31727.2).	
Service Connected Disability:		
All Members		
Eligibility	No age or service requirements (§31720).	
Benefit Formula	50% of the Final Compensation or 100% of Service Retirement benefit, if greater (§31727.4).	

Pre-Retirement Death:	
All Members	
Eligibility	None.
Basic lump sum benefit	Refund of employee contributions with interest, plus one month's compensation for each year of service, to a maximum of six month's compensation (§31781).
Death in line-of-duty	50% of Final Compensation or 100% of Service Retirement benefit, if greater, payable to spouse* or minor children (§31787).
Vested Members	
Eligibility	Five years of service.
Basic benefit	60% of the greater of Service or Non-Service Connected Disability Retirement benefit payable to surviving eligible spouse (§31765.1, §31781.1), in lieu of the basic lump sum benefit above.
Death in line-of-duty	50% of Final Compensation or 100% of Service Retirement benefit, if greater, payable to spouse or minor children (§31787). * In this summary, the continuance benefit payable to the spouse is also available to the eligible domestic partner.
Death After Retirement:	
All Members	
Lump Sum Death Benefit	$1,000 lump sum death benefit paid to the estate or designated beneficiary (§31789, §31789.13).
Service or Non-Service Connected Disability Retirement	Unless another option was selected at retirement, 60% of member's unmodified allowance continues to eligible spouse (§31760.1).* An eligible spouse is a surviving spouse who was married to the member at least one year prior to the date of retirement (§31760.1).
Service Connected Disability	Unless another option was selected at retirement, 100% of member's allowance continued to eligible spouse (§31786). * 100% of the COLA benefit is continued to the survivor upon the member's death for a member who retired prior to September 17, 2014 for service or non-service connected disability and chose the unmodified option at retirement.
Withdrawal Benefits:	
Less than Five Years of Service	Refund of accumulated employee contributions with interest (§31628).
Five or More Years of Service	If contributions left on deposit, entitled to earned benefits commencing at any time after eligible to retire (§31700).

Post-retirement Cost-of-Living Benefits:	
General Tiers 1, 2, and 3, Safety Tiers 1 and 2, and Probation Tiers 1 and 2	Annual adjustment based on Consumer Price Index to a maximum of 3% per year; excess "banked" (§31870.1).
General Tier 4, Safety 3, and Probation Tier 3	None.
Member Contributions:	Please refer to Section 4, Exhibit III for specific rates.
General Tier 1	
Basic	Entry-age based rates that provide for an annuity at age 60 equal to 1/100 of FAS1 (§31621.2).
Cost-of-Living	Entry-age based rates that provide for one-half of future Cost-of-Living costs.
General Tier 2 and General Tier 3	
Basic	Entry-age based rates that provide for an annuity at age 60 equal to 1/100 of FAS3 (§31621.2).
Cost-of-Living	Entry-age based rates that provide for one-half of future Cost-of-Living costs.
General Tier 4	50% of the total Normal Cost rate.
Safety Tier 1 and Probation Tier 1	
Basic	Entry-age based rates that provide for an annuity at age 50 equal to 1/100 of FAS1 (§31639.25).
Cost-of-Living	Entry-age based rates that provide for one-half of future Cost-of-Living costs. Safety Tier 1 Cost-of-Living member rates are offset by 1.63% of pay, which is picked up by the County.
Safety Tier 2 and Probation Tier 2	
Basic	Entry-age based rates that provide for an annuity at age 50 equal to 1/100 of FAS3 (§31639.25).
Cost-of-Living	Entry-age based rates that provide for one-half of future Cost-of-Living costs. Safety Tier 2 Cost-of-Living member rates are offset by 1.63% of pay, which is picked up by the County.
Safety Tier 3 and Probation Tier 3	50% of the total Normal Cost rate.
Other Information:	All non-CalPEPRA members with 30 or more years of service are exempt from paying member contributions.
Changes in Plan Provisions:	There have been no changes in plan provisions since the last valuation.

Note: The summary of major plan provisions is designed to outline principal plan benefits as interpreted for purposes of the actuarial valuation. If the Association should find the plan summary not in accordance with the actual provisions, the Association should alert the actuary so they can both be sure the proper provisions are valued.

EXHIBIT III – MEMBER CONTRIBUTION RATES

General Tier 1 Members' Contribution Rates Based on the June 30, 2019 Actuarial Valuation (as a % of biweekly payroll)

General – Tier 1						
	Basic		COLA		Total	
Entry Age	First $161.54	Over $161.54	First $161.54	Over $161.54	First $161.54	Over $161.54
15	3.89%	5.84%	1.35%	2.03%	5.24%	7.87%
16	3.89%	5.84%	1.35%	2.03%	5.24%	7.87%
17	3.96%	5.94%	1.37%	2.06%	5.33%	8.00%
18	4.03%	6.04%	1.40%	2.10%	5.43%	8.14%
19	4.10%	6.15%	1.43%	2.14%	5.53%	8.29%
20	4.17%	6.26%	1.45%	2.17%	5.62%	8.43%
21	4.24%	6.36%	1.47%	2.21%	5.71%	8.57%
22	4.31%	6.47%	1.50%	2.25%	5.81%	8.72%
23	4.39%	6.59%	1.53%	2.29%	5.92%	8.88%
24	4.47%	6.70%	1.55%	2.33%	6.02%	9.03%
25	4.54%	6.81%	1.58%	2.37%	6.12%	9.18%
26	4.62%	6.93%	1.61%	2.41%	6.23%	9.34%
27	4.70%	7.05%	1.63%	2.45%	6.33%	9.50%
28	4.78%	7.17%	1.66%	2.49%	6.44%	9.66%
29	4.86%	7.29%	1.69%	2.53%	6.55%	9.82%
30	4.94%	7.41%	1.71%	2.57%	6.65%	9.98%
31	5.03%	7.54%	1.75%	2.62%	6.78%	10.16%
32	5.11%	7.67%	1.77%	2.66%	6.88%	10.33%
33	5.20%	7.80%	1.81%	2.71%	7.01%	10.51%
34	5.29%	7.93%	1.83%	2.75%	7.12%	10.68%
35	5.37%	8.06%	1.87%	2.80%	7.24%	10.86%
36	5.47%	8.20%	1.90%	2.85%	7.37%	11.05%
37	5.56%	8.34%	1.93%	2.90%	7.49%	11.24%
38	5.65%	8.48%	1.97%	2.95%	7.62%	11.43%
39	5.75%	8.62%	1.99%	2.99%	7.74%	11.61%

EXHIBIT III – MEMBER CONTRIBUTION RATES (CONTINUED)

General – Tier 1 (continued)						
	Basic		COLA		Total	
Entry Age	First $161.54	Over $161.54	First $161.54	Over $161.54	First $161.54	Over $161.54
40	5.85%	8.77%	2.03%	3.05%	7.88%	11.82%
41	5.95%	8.92%	2.07%	3.10%	8.02%	12.02%
42	6.05%	9.07%	2.10%	3.15%	8.15%	12.22%
43	6.15%	9.23%	2.14%	3.21%	8.29%	12.44%
44	6.26%	9.39%	2.17%	3.26%	8.43%	12.65%
45	6.37%	9.56%	2.21%	3.32%	8.58%	12.88%
46	6.49%	9.73%	2.25%	3.38%	8.74%	13.11%
47	6.61%	9.91%	2.29%	3.44%	8.90%	13.35%
48	6.73%	10.10%	2.34%	3.51%	9.07%	13.61%
49	6.87%	10.30%	2.39%	3.58%	9.26%	13.88%
50	6.99%	10.48%	2.43%	3.64%	9.42%	14.12%
51	7.10%	10.65%	2.47%	3.70%	9.57%	14.35%
52	7.21%	10.81%	2.51%	3.76%	9.72%	14.57%
53	7.31%	10.96%	2.54%	3.81%	9.85%	14.77%
54	7.40%	11.10%	2.57%	3.86%	9.97%	14.96%
55	7.47%	11.20%	2.59%	3.89%	10.06%	15.09%
56	7.52%	11.28%	2.61%	3.92%	10.13%	15.20%
57	7.53%	11.30%	2.62%	3.93%	10.15%	15.23%
58	7.53%	11.30%	2.62%	3.93%	10.15%	15.23%
59 & Over	7.49%	11.23%	2.60%	3.90%	10.09%	15.13%

Interest: 7.00% per annum
COLA: 3.00%
Mortality: See *Section 4, Exhibit I*
Salary Increase: Inflation (3.00%) + Across-the-Board Increase (0.50%) + Merit/Promotion (See *Section 4, Exhibit I*)
COLA Loading Factor: 34.74%

EXHIBIT III – MEMBER CONTRIBUTION RATES (CONTINUED)

General Tier 2 and Tier 3 Members' Contribution Rates Based on the June 30, 2019 Actuarial Valuation (as a % of biweekly payroll)

General – Tier 2 and Tier 3						
	Basic		COLA		Total	
Entry Age	First $161.54	Over $161.54	First $161.54	Over $161.54	First $161.54	Over $161.54
15	3.75%	5.62%	1.30%	1.95%	5.05%	7.57%
16	3.75%	5.62%	1.30%	1.95%	5.05%	7.57%
17	3.81%	5.72%	1.33%	1.99%	5.14%	7.71%
18	3.88%	5.82%	1.35%	2.02%	5.23%	7.84%
19	3.95%	5.92%	1.37%	2.06%	5.32%	7.98%
20	4.01%	6.02%	1.39%	2.09%	5.40%	8.11%
21	4.08%	6.12%	1.42%	2.13%	5.50%	8.25%
22	4.15%	6.23%	1.44%	2.16%	5.59%	8.39%
23	4.23%	6.34%	1.47%	2.20%	5.70%	8.54%
24	4.29%	6.44%	1.49%	2.24%	5.78%	8.68%
25	4.37%	6.55%	1.52%	2.28%	5.89%	8.83%
26	4.45%	6.67%	1.55%	2.32%	6.00%	8.99%
27	4.52%	6.78%	1.57%	2.36%	6.09%	9.14%
28	4.60%	6.90%	1.60%	2.40%	6.20%	9.30%
29	4.67%	7.01%	1.63%	2.44%	6.30%	9.45%
30	4.75%	7.13%	1.65%	2.48%	6.40%	9.61%
31	4.83%	7.25%	1.68%	2.52%	6.51%	9.77%
32	4.92%	7.38%	1.71%	2.56%	6.63%	9.94%
33	5.00%	7.50%	1.74%	2.61%	6.74%	10.11%
34	5.09%	7.63%	1.77%	2.65%	6.86%	10.28%
35	5.17%	7.76%	1.80%	2.70%	6.97%	10.46%
36	5.26%	7.89%	1.83%	2.74%	7.09%	10.63%
37	5.35%	8.02%	1.86%	2.79%	7.21%	10.81%
38	5.44%	8.16%	1.89%	2.83%	7.33%	10.99%
39	5.53%	8.29%	1.92%	2.88%	7.45%	11.17%

EXHIBIT III – MEMBER CONTRIBUTION RATES (CONTINUED)

General – Tier 2 and Tier 3 (continued)						
	Basic		COLA		Total	
Entry Age	First $161.54	Over $161.54	First $161.54	Over $161.54	First $161.54	Over $161.54
40	5.63%	8.44%	1.95%	2.93%	7.58%	11.37%
41	5.72%	8.58%	1.99%	2.98%	7.71%	11.56%
42	5.82%	8.73%	2.02%	3.03%	7.84%	11.76%
43	5.92%	8.88%	2.05%	3.08%	7.97%	11.96%
44	6.03%	9.04%	2.09%	3.14%	8.12%	12.18%
45	6.13%	9.20%	2.13%	3.20%	8.26%	12.40%
46	6.24%	9.36%	2.17%	3.25%	8.41%	12.61%
47	6.35%	9.53%	2.21%	3.31%	8.56%	12.84%
48	6.47%	9.71%	2.25%	3.37%	8.72%	13.08%
49	6.58%	9.87%	2.29%	3.43%	8.87%	13.30%
50	6.69%	10.03%	2.32%	3.48%	9.01%	13.51%
51	6.78%	10.17%	2.35%	3.53%	9.13%	13.70%
52	6.87%	10.30%	2.39%	3.58%	9.26%	13.88%
53	6.94%	10.41%	2.41%	3.62%	9.35%	14.03%
54	6.99%	10.49%	2.43%	3.64%	9.42%	14.13%
55	7.03%	10.54%	2.44%	3.66%	9.47%	14.20%
56	7.03%	10.55%	2.45%	3.67%	9.48%	14.22%
57	7.01%	10.51%	2.43%	3.65%	9.44%	14.16%
58	7.24%	10.86%	2.51%	3.77%	9.75%	14.63%
59 & Over	7.49%	11.23%	2.60%	3.90%	10.09%	15.13%

Interest:	7.00% per annum
COLA:	3.00%
Mortality:	See *Section 4, Exhibit I*
Salary Increase:	Inflation (3.00%) + Across-the-Board Increase (0.50%) + Merit/Promotion (See *Section 4, Exhibit I*)
COLA Loading Factor:	34.74%

EXHIBIT III – MEMBER CONTRIBUTION RATES (CONTINUED)

General Tier 4 Members' Contribution Rates Based on the June 30, 2019 Actuarial Valuation (as a % of eligible payroll)[1]

	General – Tier 4	
	Basic	Total
Entry Age	Eligible Pay	Eligible Pay
All Ages	7.46%	7.46%

(1) It is our understanding that in the determination of pension benefits under the CalPEPRA formulas, the compensation that can be taken into account for 2019 is equal to $124,180. (For an employer that is not enrolled in Social Security, the maximum amount is 120% of $124,180, or $149,016). (reference: Section 7522.10). These amounts should be adjusted for changes to the Consumer Price Index for All Urban Consumers after 2019. (reference: Section 7522.10(d))

Interest:	7.00% per annum
COLA:	0%
Mortality:	See *Section 4, Exhibit I*
Salary Increase:	Inflation (3.00%) + Across-the-Board Increase (0.50%) + Merit/Promotion (See *Section 4, Exhibit I*)
COLA Loading Factor:	0%

EXHIBIT III – MEMBER CONTRIBUTION RATES (CONTINUED)

Safety Tier 2 Members' Contribution Rates Based on the June 30, 2019 Actuarial Valuation (as a % of biweekly payroll)

Safety – Tier 2						
	Basic		COLA[1]		Total	
Entry Age	First $161.54	Over $161.54	First $161.54	Over $161.54	First $161.54	Over $161.54
15	4.81%	7.21%	1.27%	2.72%	6.08%	9.93%
16	4.81%	7.21%	1.27%	2.72%	6.08%	9.93%
17	4.89%	7.33%	1.32%	2.79%	6.21%	10.12%
18	4.97%	7.46%	1.37%	2.87%	6.34%	10.33%
19	5.05%	7.58%	1.41%	2.94%	6.46%	10.52%
20	5.14%	7.71%	1.47%	3.02%	6.61%	10.73%
21	5.23%	7.84%	1.52%	3.10%	6.75%	10.94%
22	5.31%	7.97%	1.57%	3.18%	6.88%	11.15%
23	5.40%	8.10%	1.63%	3.25%	7.03%	11.35%
24	5.49%	8.24%	1.68%	3.34%	7.17%	11.58%
25	5.58%	8.37%	1.73%	3.42%	7.31%	11.79%
26	5.67%	8.51%	1.79%	3.50%	7.46%	12.01%
27	5.77%	8.65%	1.85%	3.59%	7.62%	12.24%
28	5.86%	8.79%	1.90%	3.67%	7.76%	12.46%
29	5.96%	8.94%	1.96%	3.76%	7.92%	12.70%
30	6.06%	9.09%	2.02%	3.85%	8.08%	12.94%
31	6.16%	9.24%	2.08%	3.94%	8.24%	13.18%
32	6.26%	9.39%	2.14%	4.03%	8.40%	13.42%
33	6.37%	9.55%	2.21%	4.13%	8.58%	13.68%
34	6.47%	9.70%	2.27%	4.22%	8.74%	13.92%
35	6.58%	9.87%	2.34%	4.32%	8.92%	14.19%
36	6.69%	10.03%	2.40%	4.42%	9.09%	14.45%
37	6.81%	10.21%	2.48%	4.53%	9.29%	14.74%
38	6.91%	10.37%	2.54%	4.62%	9.45%	14.99%
39	7.03%	10.54%	2.61%	4.72%	9.64%	15.26%

EXHIBIT III – MEMBER CONTRIBUTION RATES (CONTINUED)

Safety – Tier 2 (continued)						
	Basic		COLA[1]		Total	
Entry Age	First $161.54	Over $161.54	First $161.54	Over $161.54	First $161.54	Over $161.54
40	7.14%	10.71%	2.67%	4.83%	9.81%	15.54%
41	7.25%	10.88%	2.74%	4.93%	9.99%	15.81%
42	7.37%	11.06%	2.81%	5.04%	10.18%	16.10%
43	7.50%	11.25%	2.89%	5.15%	10.39%	16.40%
44	7.60%	11.40%	2.95%	5.24%	10.55%	16.64%
45	7.66%	11.49%	2.99%	5.30%	10.65%	16.79%
46	7.69%	11.53%	3.01%	5.32%	10.70%	16.85%
47	7.66%	11.49%	2.99%	5.30%	10.65%	16.79%
48	7.91%	11.87%	3.14%	5.53%	11.05%	17.40%
49 & Over	8.18%	12.27%	3.30%	5.77%	11.48%	18.04%

[1] COLA rate is offset by 1.63%, which is picked up by the County.

Interest: 7.00% per annum
COLA: 3.00%
Mortality: See *Section 4, Exhibit I*
Salary Increase: Inflation (3.00%) + Across-the-Board Increase (0.50%) + Merit/Promotion (See *Section 4, Exhibit I*)
COLA Loading Factor: 60.29%

EXHIBIT III – MEMBER CONTRIBUTION RATES (CONTINUED)

Safety Tier 3 Members' Contribution Rates Based on the June 30, 2019 Actuarial Valuation (as a % of eligible payroll)[1]

	Safety – Tier 3	
	Basic	Total
Entry Age	Eligible Pay	Eligible Pay
All Ages	10.98%	10.98%

[1] It is our understanding that in the determination of pension benefits under the CalPEPRA formulas, the compensation that can be taken into account for 2019 is equal to $124,180. (For an employer that is not enrolled in Social Security, the maximum amount is 120% of $124,180, or $149,016). (reference: Section 7522.10). These amounts should be adjusted for changes to the Consumer Price Index for All Urban Consumers after 2019. (reference: Section 7522.10(d))

Interest:	7.00% per annum
COLA:	0%
Mortality:	See *Section 4, Exhibit I*
Salary Increase:	Inflation (3.00%) + Across-the-Board Increase (0.50%) + Merit/Promotion (See *Section 4, Exhibit I*)
COLA Loading Factor:	0%

Probation Tier 2 Members' Contribution Rates Based on the June 30, 2019 Actuarial Valuation (as a % of biweekly payroll)

Probation – Tier 2						
	Basic		COLA		Total	
Entry Age	First $161.54	Over $161.54	First $161.54	Over $161.54	First $161.54	Over $161.54
15	4.81%	7.21%	2.35%	3.52%	7.16%	10.73%
16	4.81%	7.21%	2.35%	3.52%	7.16%	10.73%
17	4.89%	7.33%	2.39%	3.58%	7.28%	10.91%
18	4.97%	7.46%	2.43%	3.64%	7.40%	11.10%
19	5.05%	7.58%	2.47%	3.70%	7.52%	11.28%
20	5.14%	7.71%	2.51%	3.77%	7.65%	11.48%
21	5.23%	7.84%	2.55%	3.83%	7.78%	11.67%
22	5.31%	7.97%	2.59%	3.89%	7.90%	11.86%
23	5.40%	8.10%	2.64%	3.96%	8.04%	12.06%
24	5.49%	8.24%	2.69%	4.03%	8.18%	12.27%
25	5.58%	8.37%	2.73%	4.09%	8.31%	12.46%
26	5.67%	8.51%	2.77%	4.16%	8.44%	12.67%
27	5.77%	8.65%	2.82%	4.23%	8.59%	12.88%
28	5.86%	8.79%	2.86%	4.29%	8.72%	13.08%
29	5.96%	8.94%	2.91%	4.37%	8.87%	13.31%
30	6.06%	9.09%	2.96%	4.44%	9.02%	13.53%
31	6.16%	9.24%	3.01%	4.51%	9.17%	13.75%
32	6.26%	9.39%	3.06%	4.59%	9.32%	13.98%
33	6.37%	9.55%	3.11%	4.67%	9.48%	14.22%
34	6.47%	9.70%	3.16%	4.74%	9.63%	14.44%
35	6.58%	9.87%	3.21%	4.82%	9.79%	14.69%
36	6.69%	10.03%	3.27%	4.90%	9.96%	14.93%
37	6.81%	10.21%	3.33%	4.99%	10.14%	15.20%
38	6.91%	10.37%	3.38%	5.07%	10.29%	15.44%
39	7.03%	10.54%	3.43%	5.15%	10.46%	15.69%

EXHIBIT III – MEMBER CONTRIBUTION RATES (CONTINUED)

Probation – Tier 2 (continued)						
	Basic		COLA		Total	
Entry Age	First $161.54	Over $161.54	First $161.54	Over $161.54	First $161.54	Over $161.54
40	7.14%	10.71%	3.49%	5.23%	10.63%	15.94%
41	7.25%	10.88%	3.55%	5.32%	10.80%	16.20%
42	7.37%	11.06%	3.60%	5.40%	10.97%	16.46%
43	7.50%	11.25%	3.67%	5.50%	11.17%	16.75%
44	7.60%	11.40%	3.71%	5.57%	11.31%	16.97%
45	7.66%	11.49%	3.74%	5.61%	11.40%	17.10%
46	7.69%	11.53%	3.75%	5.63%	11.44%	17.16%
47	7.66%	11.49%	3.74%	5.61%	11.40%	17.10%
48	7.91%	11.87%	3.87%	5.80%	11.78%	17.67%
49 & Over	8.18%	12.27%	4.00%	6.00%	12.18%	18.27%

Interest:	7.00% per annum
COLA:	3.00%
Mortality:	See *Section 4, Exhibit I*
Salary Increase:	Inflation (3.00%) + Across-the-Board Increase (0.50%) + Merit/Promotion (See *Section 4, Exhibit I*)
COLA Loading Factor:	48.86%

EXHIBIT III – MEMBER CONTRIBUTION RATES (CONTINUED)

Probation Tier 3 Members' Contribution Rates Based on the June 30, 2019 Actuarial Valuation (as a % of eligible payroll)[1]

Probation – Tier 3		
	Basic	Total
Entry Age	Eligible Pay	Eligible Pay
All Ages	11.30%	11.30%

(1) It is our understanding that in the determination of pension benefits under the CalPEPRA formulas, the compensation that can be taken into account for 2019 is equal to $124,180. (For an employer that is not enrolled in Social Security, the maximum amount is 120% of $124,180, or $149,016). (reference: Section 7522.10). These amounts should be adjusted for changes to the Consumer Price Index for All Urban Consumers after 2019. (reference: Section 7522.10(d))

Interest:	7.00% per annum
COLA:	0%
Mortality:	See *Section 4, Exhibit I*
Salary Increase:	Inflation (3.00%) + Across-the-Board Increase (0.50%) + Merit/Promotion (See *Section 4, Exhibit I*)
COLA Loading Factor:	0%

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